

ARMY RESEARCH AND DEVELOPMENT



MONTHLY NEWSMAGAZINE OF THE OFFICE OF THE CHIEF, RESEARCH AND DEVELOPMENT
Vol. 3, No. 2 February 1962 • HEADQUARTERS, DEPARTMENT OF THE ARMY • Washington 25, D.C.

Army Reorganization Effects Sweeping Changes in R&D

Plans Group Developing Implementing Proposals

An important role in planning implementation of the reorganization of the Army as related to research, development, testing and evaluation of military materiel, including programming, is assigned to a committee headed by Col Wilson R. Reed, Deputy Chief of the Management Analysis Division, OCRD.

Col Reed defined the mission of his committee as "developing the missions, functions, personnel, procedures and relationships at all levels of RDT&E involved in the reorganization of the Army."

Working on the committee are Lt Col George Sammet, Jr., Assistant Chief, Combat Materiel Division, OCRD; Lt Col James B. Healy, Chief, Advanced Air Defense Division, OCRD; and Maj Donald F. Packard, Physical Sciences Division, U.S. Army Research Office.

In addition to developing implementation plans as suggested guides for Commanding Generals of the new Materiel Development and Logistic Command and the new Combat Developments Command, Col Reed's committee will serve in an advisory capacity to the commanders and their respective activation planning groups.

Materiel Development and Logistic Command, Combat Developments Command Established; USCONARC Gets Major Training Role; 5 Technical Services Dismembered

Based on recommendations of the Hoelscher Committee for broad reorganization of the U.S. Army, a plan carrying all necessary high-level approval, but still subject to action by Congress, is scheduled for implementation during an 18-month period.

Commanding Generals of a new Materiel Development and Logistic Command, a new Combat Developments Command, and a U.S. Continental Army Command given vastly revised functions, are expected to be assigned this month. Each will have authority to select a planning group to work out implementing actions, starting this month.

Traditional operational responsibilities of five of the seven Technical Services will be delegated largely to the new commands. However, the Corps of Engineers will retain its civil works responsibilities and The Surgeon General's functions will remain relatively unaffected.

Each of the Technical Services will continue as a branch of the Army for classification of officers assigned to those career fields. Offices of the Chief of Ordnance and the Chief Chemical Officer will be abolished. Many of the Quartermaster General functions will be consolidated under a new Chief of Support Services, at the same Army Special Staff level as chiefs of the other branches.

The Chief of Research and Development will retain his title, with responsibility paralleling the Deputy

(Continued on page 3)



Secretary of the Army Elvis J. Stahr, Jr. (above) announced on Jan. 16 plans for broad reorganization based on an 8-month study by a high-level committee headed by Deputy Comptroller of the Army Leonard W. Hoelscher. Secretary of Defense Robert S. McNamara directed action.

Commission Ups Scientist, Engineer Entrance Pay

Higher entrance salaries for engineers and scientists in grades GS-9, 10 and 11 become effective this month.

Acting under its authority to grant higher pay to the so-called shorter-category employees, so long as the rate does not exceed the top regular within grade step of the employee's pay-grade, the Civil Service Commission announced the increased entrance pay last month, as follows:

Grade GS-9, from \$6,435 (first step) to \$7,095 (fifth step); GS-10, from \$6,995 (first step) to \$7,655 (fifth step); GS-11, from \$7,560 (first step) to \$8,340 (fourth step).

The action gives raises to about 19,000 engineers and 7,000 scientists in Government service who currently are below the new entrance pay levels. Their extra pay is estimated at about \$9 million.

The Commission believes the new rates will prove helpful in recruiting about 6,300 engineers and scientists needed during the coming year, at an estimated additional cost of \$5 million.

Featured in This Issue . . .

Questions and Answers on Army reorganization, pages 9-10-11.

Concept organizational charts of Materiel Development and Logistic Command, and the Combat Developments Command, pages 12 and 13.

OCRD manpower survey goals, page 6.

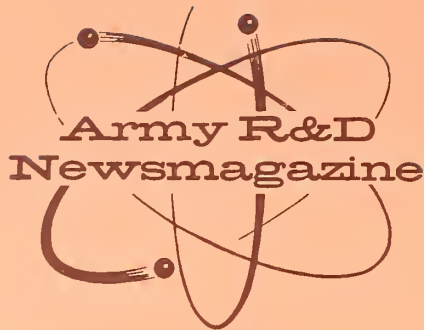
Patents knowledge viewed as useful tool for R&D personnel, page 16.

Quartermaster research seeks improved personnel armor material, page 14.

Ordnance Corps gains by study of foreign weapon developments, page 21.

ASPR XV provisions explained for benefit of contractors, page 23.

Project ADVENT Advances with erection of antenna stations, page 24.



VOL. 3, NO. 2 FEBRUARY 1962

Published monthly by the Army Research Office, Office of the Chief of Research and Development, Department of the Army, Washington 25, D.C., in coordination with the Technical and Industrial Liaison Office, OCRD. Grateful acknowledgement is made for the valuable assistance of Technical Liaison Offices within the Technical Services and the U.S. Continental Army Command. Publication is authorized by AR 310-1, dated 15 May 1956.

Purpose: To improve informal communication among all segments of the Army scientific community and other Government R&D agencies; to further understanding of Army R&D progress, problem areas and program planning; to stimulate more closely integrated and coordinated effort among the widely dispersed and diffused Army R&D activities; to maintain a closer link from top management through all levels to scientists, engineers and technicians at the bench level; to express views of leaders, as pertinent to their responsibilities, and to keep personnel informed on matters germane to their welfare and pride of service.

Picture Credits: Unless otherwise indicated, all illustrations are by the U.S. Army.

Submission of Material: All articles submitted for publication must be channeled through the technical liaison or public information officer at installation or command level.

By-lined Articles: Accuracy and relevancy of contents of this publication to accomplishment of the Army R&D mission are of constant concern to the editors. Primary responsibility for opinions of by-lined authors rests with them; their views do not necessarily reflect the official policy or position of the Department of the Army.

DISTRIBUTION is made automatically each month based on requirements stated on DA Form 12-4, permitting changes as necessary.

Distribution requirements for the Office of the Secretary of the Army, Under Secretary of the Army, Assistant Secretary of the Army R&D, Chief of Staff, Chief of Research and Development, and Chief of Information will be submitted by the Office of the Chief of Research and Development.

All other Department of the Army agencies should submit their requirements through channels to the Army Publications Distribution Center servicing them.

Changes in requirements of other Government agencies should be submitted directly to the Army Research Office, OCRD, Department of the Army, Washington 25, D.C., ATTN: Scientific Information Branch.

SUBSCRIPTIONS. Public sale of this publication is authorized through the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. Single copies sell for 20 cents. Subscription rates (12 copies annually) are: Domestic (including APO and FPO addresses), \$2.25; Foreign, \$3.00.

Theme of the Month

By Dr. Craig M. Crenshaw
Chief Scientist for R&D, CSigO

"Le mieux est l'ennemi du bien," or "the best is the enemy of the good," as Voltaire quoted in 1764, is still applicable. Good equipment in the research stage should be fielded without waiting for the best detector, the best equipment, or the best circuit. The prime mission of research and development is to get good equipment to the troops rapidly. I say, good, not the best, because time can be lost in insuring that equipment is the best. This time, once lost, can never be recouped. Timeliness of fielding the equipment must be brought to the attention of the laboratory engineer so that it can be considered in the compromises he makes.

Good equipment is that which will aid in accomplishing a needed function on the battlefield on the second day of battle. It must perform better than its predecessor and hopefully better than the enemy's counterpart. Equipment which works on the second day of battle will be rugged, reliable, useful and effective. Otherwise our troops will have thrown it out.

This evaluation is too late to help in R&D work so we must substitute tests of all types, the earlier, the better. Testing for performance appreciably better than the known performance of its predecessor is straightforward. Whether it is better than the enemy counterpart depends on how well we have done our job and how well the enemy have done their job.

If a technical task is easy to accomplish, a scientific enemy will probably have accomplished it also. If through research and development a submarginal capability can be transformed into a successful capability, we may have stolen a march on a scientific enemy. If something unique has been accomplished which appeared to be impossible, we probably have outperformed our scientific enemy. These are the giant strides which we should attempt.

Science owes much to the military. Archimedes was an early military scientist. His contributions to the defense of Syracuse were so effective that enemy troops approaching the wall would break and run for cover when one of his machines appeared over the parapet. The city was finally conquered by treachery.

Meteorological storm forecasting was started by decree of the French King to the Royal Academy to prevent the reoccurrence of the loss of the pride of the French Navy and accompanying ships by a hurricane-like storm of Balaclava in the Black Sea during the Crimean War. The French scientists rose to the challenge and the science of storm prediction was started.

In the early days of meteorology in the United States, the Signal Corps was given the weather prediction mission. The available equipment was installed along the Army telegraph lines and in the large cities. Viewed from today's standards, the equipment and data were extremely crude; however, the daily forecasts or probabilities were 74 percent accurate in 1887.

When a new concept or technique of a revolutionary nature is adopted by the Army, immediate fielding of a limited system is essential. The surveillance drone SD-1 is an ideal example of this. The SD-1 was a crash conversion of a target drone to carry photographic equipment. Drone surveillance needed the realism of troop experience and the ingenuity of field commanders to develop fully. The SD-1 has in a large measure accomplished this purpose. The information and experience obtained has been of significant value during development of technically superior surveillance drones.

In the continual attempt to get good equipment to the troops rapidly, the development engineers are faced with the choice between using well-proven components which are bulky, or new devices which, though lighter, may have troubles when made on a production line basis. There is no easy solution.

The consolidation of essentially 90 percent of the Signal Corps research and development effort in one laboratory aids materially in the rapid introduction of new devices and components into hardware. A typical example is the antenna for the VRC-12 radio which was invented and put into the production model all in less than two years. Its introduction gave an increased capability. The development engineer is kept aware of new devices by his coworkers down the hall, and he can get a realistic appraisal of the time production lots will be available.

We should all remember that by default "Delay is a decision not to act." "Decision by design—not by default" makes a dynamic organization.

Army Reorganization Effects Sweeping Changes in R&D

(Continued from page 1)

Chief of Staff for Logistics, Deputy Chief of Staff for Personnel, Deputy Chief of Staff for Operations, and other Army staff agencies.

The powerful new Materiel Development and Logistic Command, expected to be commanded by a 4-star General, and the Combat Developments Command, like the U.S. Continental Army Command, will have direct line of command to the Army Chief of Staff.

Secretary of the Army Elvis J. Stahr, Jr., made two explanatory statements in mid-January. They presented the broad picture of the reorganization, its purpose, how it will be accomplished, and the anticipated impact on personnel, existing installations and functions.

Additional information was given in a questions and answers press release. Still many of the precise bits of information that may be desired, particularly by personnel involved, will not be forthcoming except in piecemeal fashion as developed in coming months by planning groups.

Secretary Stahr said the reorganization plan approved by President Kennedy and Secretary of Defense Robert S. McNamara, following review by Chief of Staff General George H. Decker, "calls for little change in military and civilian personnel situations at the operating level in the field."

The main impact of the plan, Stahr said, is on Headquarters of the Department of the Army, the U.S. Continental Army Command, the new Materiel Development and Logistic Command and the Combat Developments Command.

Reshuffling of some personnel from Army Headquarters to field command headquarters is anticipated, though they are expected to remain for the most part in the Washington, D.C. area. "Below these headquarters," it was stated, "installations and personnel, by and large, are undisturbed." The Secretary further emphasized that:

"While this reorganization is being accomplished, maximum consideration will be given to human factors. Careers will not be interrupted or altered needlessly. When the reorganization is completed, I confidently expect that our dedicated military and civilian personnel will find their career opportunities have been considerably broadened. The new structure permits talents to be utilized on a Service-wide basis to a greater extent than ever before."

The fundamental objective of the reorganization as stated by Secretary Stahr is "to improve the Army's ability to carry out its responsibilities in today's uncertain and complex international environment. This requires an organizational structure that will respond quickly and effectively to varied threats across the whole spectrum of conflict from cold to limited to general war."

Other stated objectives of the reorganization are to:

- Eliminate duplication of effort and excessive fragmenting of functions, responsibilities and resources.

- Consolidate responsibilities for personnel management, training, combat developments, research and development, and logistics functions in the smallest practicable number of commands and agencies.

- Provide an organization which is better aligned to changes in the general Defense environment which have evolved since 1953, the date of the last comprehensive study of the Department of the Army organization.

- Improve effectiveness by more clearly fixing responsibility for accomplishment of major tasks and by simplifying and strengthening the command and management structure.

- Provide for more flexible use of the skills and capabilities of military personnel and for correspondingly broader technical opportunities.

- Delegate to subordinate commands and agencies all functions which need not be performed at the level of the Secretary of the Army and the Army General Staff.

Secretary Stahr said the plan calls for six main actions:

- Establishing a Materiel Development and Logistic Command to perform the materiel development, procurement and supply functions currently divided among several of the Technical Services, and the service test and evaluation function currently assigned to the Continental Army Command.

- Establishing an Army Combat Developments Command to perform the combat development functions presently assigned to CONARC, the Technical and Administrative Services, and other agencies.

- Assigning to the U.S. Continental Army Command responsibility for almost all individual and unit training throughout the Army.

- Relieving the Department of the Army General Staff of certain command-like and operating functions to permit greater emphasis on planning, programing, policy-making and gen-

eral supervision of the over-all effort.

- Establishing an Office of Personnel Operations at the Special Staff level to control centrally the career development and assignment of military personnel—both officer and enlisted.

- Realigning the Department of the Army Special Staff and Operating Agencies to reflect the establishment of the two new commands, the expansion of CONARC's training responsibilities and centralized control of military personnel management.

MDLC FUNCTIONS. Testing of new weapons and equipment, now assigned to CONARC and the Technical Services, will be a part of the MDLC wholesale materiel functions, including R&D, procurement and production, inventory management, storage and distribution, maintenance and disposal. Secretary Stahr said:

"The MDLC will control the development, testing, production and supply of materiel, including operation of laboratories, arsenals, proving grounds, test ranges, depots and transportation terminals. It will provide command supervision over the critical transitions from development to production to supply. This will enable the Army Staff to look to one source for information on wholesale materiel matters and associated transportation services.

"This change will not discontinue the Technical Services as branches; nor will there be any significant changes in the arsenals, laboratories, depots, test ranges or installations: . . .

"The organizational structure of the MDLC will permit broad utilization of the project management concept.

"Placing development, production and supply functions in a single command will facilitate combined engineer and service testing, reduce requirements for lateral coordination, and shorten lead time.

"Test agencies and other elements of the command will be staffed with combat arms personnel, as well as Technical Service personnel, to ensure that combat requirements of the ultimate user are clearly met.

"MDLC will have five development and production commands which will have central responsibility for procurement in support of the wholesale materiel of the Army. Procurement at installation level will be limited to support of local operating requirements. Each of these commodity commands will place and administer

(Continued on next page)

Army Reorganization Alters Traditional R&D Structure

(Continued from page 3)

contracts at its headquarters installations, thereby centralizing administrative and technical decision."

ACDC FUNCTIONS. In taking over responsibilities presently divided among CONARC, Technical and Administrative Services, the Army Combat Developments Command will develop organizational and operational doctrine, materiel objectives and qualitative requirements, war gaming and field experimentation, and cost-effectiveness studies.

Staffed with personnel now in the combat development system and in the Army school system who are responsible for doctrine, field manuals and preparation of TO&E, the ACDC will include the Combat Development Experimentation Center at Fort Ord, Calif., and many small agencies normally found at each Army school. Emphasis will be on development and introduction of "forward-looking concepts throughout the Army."

USCONARC FUNCTIONS. Training of Active Army, Army National Guard and Army Reserve will be accomplished by USCONARC, which will assume responsibility for Army units now belonging to the Technical Services. USCONARC will take over 3 major installations, 3 training centers and 17 schools assigned to Technical and Administrative Services.

Test Boards, now a part of USCONARC, will be reassigned to the MDLC. Strength at USCONARC field installations will be "somewhat increased through expansion of its training mission, assignment of units formerly under the Technical Services, and acquisition of responsibility for certain installations."

Centralized direction of both combat arms and Technical Service personnel will become a USCONARC mission; presently it is responsible only for the individual training of combat arms personnel. The consolidation is expected to facilitate providing combat-ready forces, on short notice, to meet operational requirement, including those of Army components of unified and specified commands.

GENERAL STAFF FUNCTIONS. The Department of the Army General Staff will be organized to strengthen planning, programing, systems management and compatibility with the operating procedures of the Office of the Secretary of Defense and the Joint Chiefs of Staff.

The simplified subordinate command structure to be established will relieve the General Staff of many

command-like and detailed operation functions. A Director of Programs will be established as the principal assistant to the Chief of Staff and Vice Chief of Staff for direction of the Army program system. The aim will be to detail plans into well-defined and measurable projects, including costs of such projects over an extended period of time.

OPO FUNCTIONS. In detailing the functions of an Office of Personnel Operations, Secretary Stahr said it "will integrate in a single office the personnel operations now performed by many other agencies and will control centrally the career development and assignment of both officer and enlisted personnel."

The combat arms, Technical and Administrative Services, will continue to provide the framework for officer personnel management, though officers careers will be managed by OPO. Existing personnel offices of each branch will retain their identities as assignment sections. Other OPO elements will be staffed with officers from all branches to insure knowledge of personnel needs and resources.

The only personnel not subject to OPO control will be commissioned officers of the Army Medical Service, the Judge Advocate General Corps and the Chaplains.

STATUTORY CHANGES. Secretary Stahr said the reorganization will be accompanied by removal of the statutory provisions for the Chief Signal Officer, The Adjutant General,

ERDL Testing Thermoelectric Air Conditioner

Testing of a compact new type of air conditioner, employing thermoelectric principles instead of refrigerant gases, is directed primarily to Army missile needs, but "exciting" commercial development possibilities are envisioned.

Being tested at the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va., the prototype was developed under contract with the American Radiator and Standard Sanitary Corp. Designed for use in missile vans, it requires no compressor, evaporator or condenser. Since it uses no refrigerant gas, leakage is not a problem.

Overall dimensions of approximately 23" x 36" x 12" permit installation within the van wall. The test unit weighs approximately 80 pounds and is rated at ½-ton capacity.

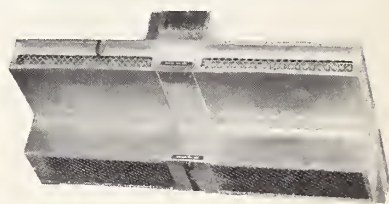
Described by the contractor as "the first portable operational air conditioner to employ the revolutionary thermoelectric principle," the unit is

the Quartermaster General, the Chief of Finance, the Chief of Ordnance, the Chief Chemical Officer and the Chief of Transportation. Pursuant to the National Security Act of 1947, necessary action was initiated by Secretary of Defense McNamara in mid-January. The action cannot be effective until 30 days after it is reported to the Senate Armed Services Committee and the House of Representatives.

Because of his Civil Works functions, which will remain unchanged, the Chief of Engineers will remain a statutory position. The Surgeon General's statutory position also will be retained. Army-wide service functions of the Chief Signal Officer, Chief of Finance, Chief of Transportation and The Adjutant General will be performed by Special Staff Officers with the same titles. As mentioned earlier, certain functions of the Quartermaster General, Chief of Ordnance and the Chief Chemical Officer will be consolidated in a new Chief of Support Services.

Implementation of the reorganization plan, Secretary Stahr said, "will be carefully controlled to insure that our combat capability is fully maintained and that the transition is made in an orderly manner with minimum personnel disruption." He closed his prepared statement with:

"The primary purpose of this reorganization is to develop an Army with the best possible command structure, management, training, doctrine, weapons, equipment and morale. I am certain that national security will be strengthened by this undertaking."



Prototype of new thermoelectric air conditioner measures 23" x 36" x 12"

regarded as the forerunner of much smaller models. Company engineers believe future designs may be fitted flush into any standard 4-inch wall.

Featuring a "heart" of matched pairs of "dime-size" bismuth telluride plugs, little more than an eighth-inch thick, through which a direct current is passed to generate heat and cold, the unit's only moving parts are eight high-speed miniature fans. Air is circulated through fins attached to each element, passing through top and bottom vents of the unit.



Reviewing Watertown Arsenal Laboratories Monograph MS-40 "Metallurgical Advisory Committee on Guns" are (left to right) Mr. J. H. Penrose, Watervliet Arsenal; Col R. B. Braid, Watertown Arsenal Commanding Officer; Mr. A. O. Schaefer, Vice President, Metallurgy, Struthers Wells Corp.; and Lt Col H. V. Mackey, Chief of Research and Engineering, Watervliet Arsenal.

Watervliet Briefs Metallurgical Advisers on Guns

Progress in establishing quantitative toughness criteria in high-strength bulk material was the subject of a recent Ordnance Corps briefing made at Watervliet Arsenal, Watervliet, N.Y., to the Metallurgical Advisory Committee on Guns.

Comprised of technical personnel of the steel industry, the committee is administered by the Ordnance Corps Ferrous Metallurgical Laboratories at Watertown Arsenal, Mass.

Col R. B. Braid, Watertown Commanding Officer and Chairman of the Committee, called attention to the serious brittle failures that have been encountered with increasing incidence as higher strength materials have been utilized to reduce the overall weight of Ordnance items.

"Classical yield-strength considerations, generally adequate in the past," he said, "must be supplemented by quantitative toughness criteria to avoid the indiscriminate use of higher and higher strength materials which in recent years has too often resulted in failures."

Col W. M. Tisdale, Commanding Officer, Watervliet Arsenal, reported that in the development of improved cannon, "The metallurgical problem in utilizing minimum yield strengths of 200,000 p.s.i. in cannon tubes and recoilless rifles is not only attainment of the strength level . . . but also retention of ductility and toughness." Innumerable publications and releases attest to the fact that 250,000 p.s.i., 300,000 p.s.i., and even higher strength levels are being reported, he said.

"The most promising improvements in steel processing," he stated, "such as oxygen enrichment, vacuum melting and degassing, as well as improved rolling, forging and extrusion

methods and techniques reported by industry, give assurance that marked advances in ductility and toughness at higher strength levels in steels for guns are possible."

Cochairmen of the technical sessions were Mr. A. O. Schaefer, Industrial Coordinator of the meeting and Vice President, Metallurgy, Struthers Wells Corp.; Mr. E. N. Hegge, Vice Chairman of the Committee and Deputy Director, Watertown Arsenal Laboratories; and Lt Col H. V. Mackey, Chief of Research and Engineering, Watervliet Arsenal.

N. S. Glassman, Chief Engineer, Artillery and Vehicle Systems Branch, Research and Development Division, Office, Chief of Ordnance, in an introductory presentation, apprised the steel industry of the part to be played by tubed artillery and other conventional weapons. His presentation was entitled "Guns in the Next Decade."

Speakers at the technical sessions, in addition to Mr. Glassman, included metallurgists and materials engineers from Frankford, Watertown and Watervliet Arsenals.

Pacific Mosquitoes Given 'Life Term' in Penitentiary

Some malaria-infected mosquitoes emigrated from the Southwest Pacific, got as far as Illinois, and ended up in Statesville Penitentiary, just out of Chicago. They are not doing too badly there, though. They live in a climatically controlled insectary, and are permitted to nibble on selected fellow inmates, on occasion, to further the knowledge on malaria.

This "home away from home" for foreign mosquitoes is the Army Medical Research and Development Command's Malaria Research Project. Experiments have been carried on at the Penitentiary since the end of World War II, with the cooperation and assistance of the Prison Warden, Frank J. Pate.

The Patriotic Civilian Service Award was recently presented to Warden Pate for his excellent support of this program. The Army Medical Research and Development Command sent Lt Col Henry J. Donnelly, MC, Chief of the Preventive

150 Leaders Participate In RDT&E Conference

High ranking officials of the Department of Defense and the Armed Forces joined with nearly 150 other leading administrators at the Second Conference on Management Problems of Military RDT&E.

Sponsored by the Defense Research and Engineering Policy Council, the conference was held Jan. 8-9 at the Marine Corps Schools, Quantico, Va. Emphasis in major presentations at each of the four sessions was on problems of long-range planning, limited war capabilities, production, budgeting and national policy.

Keynote speaker was Dr. Harold Brown, Director of Defense Research and Engineering and Chairman of the Defense Research and Engineering Policy Council. Dr. Finn J. Larsen, Assistant Secretary of the Army (R&D), discussed policy based on the President's Inaugural Address.

Among the leading speakers were Charles J. Hitch, Assistant Secretary of Defense (Comptroller); Brockway McMillan, Assistant Secretary of the Air Force (R&D); Representative George H. Mahon, Chairman of the House of Representatives Subcommittee on Defense Appropriations; General D. M. Shoup, Commandant, U.S. Marine Corps.

Other top-ranking speakers included John H. Rubel, Assistant Secretary of Defense (DDDR&E); Lt Gen Arthur G. Trudeau, Chief of Research and Development, Department of the Army; Dr. C. C. Furnas, Chairman, Defense Science Board; James H. Wakelin, Jr., Assistant Secretary of the Navy (R&D); Rear Adm F. L. Ashworth, Assistant Chief for RDT&E, U.S. Navy, Bureau of Weapons; Vice Adm John T. Hayward, Deputy Chief of Naval Operations; and Lt Gen James Ferguson, Air Force Deputy Chief of Staff for Research and Technology.

Medicine Research Branch, to Statesville to present the award.

Through a contract with the Army Medical Research and Development Command, Dr. Alf Alving, of the University of Chicago, has been carrying on a continuous malaria research project at the Statesville Penitentiary. Two Army doctors, Capts Robin Powell and George Brewer, a civilian nurse, Mrs. Shirley Swanson, and a group of laboratory assistants, who have been selected and trained from the inmate population, assist Dr. Alving on the project.

Over the years some 4,000 prisoners have volunteered for this research study. There has never been a fatality. Morale among the volunteers is good. The inmates working on the project are highly motivated, intelligent and well-informed.

Dr. Alving's project has to do with the possible toxicity resulting from and the response to different amounts of preventive and prophylactic drugs.

OCRD Manpower Surveys Seek Improved Utilization Of Resources Involving Over \$200 Million Payroll

Since the Chief of Research and Development was assigned responsibility by the Secretary of the Army in July 1960 for management of RDT&E manpower of the Technical Services, seven manpower surveys have been conducted to improve utilization of resources involving an annual civilian payroll of more than \$200 million.

In the fall of 1960, the Director of Plans and Management established a Manpower and Personnel Division in his directorate, to discharge the new responsibility for manpower management and broadened responsibility for civilian personnel management.

As a primary means of achieving his goal to obtain maximum use of RDT&E (Research, Development, Testing and Evaluation) manpower resources, the Chief of Research and Development placed a high priority on manpower surveys of RDT&E installations and activities.

In January 1961, the first on-site survey was conducted by the U.S. Army R&D Manpower Survey Office. Since then, six other surveys have been undertaken. The most recent will be completed this month at the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J.

Based on experience gained in the early stages of the new RDT&E manpower management program, and in recognition of the peculiar characteristics of RDT&E activity, as opposed to other Army activity, OCRD issued Regulations 616-1 and 616-2.

Containing the broad policies and guidance for maximum utilization of RDT&E manpower, 616-1 is oriented toward the maximum use of all types of manpower. On the other hand, 616-2 is designed especially to provide a firm basis for the direction of the maximum efforts of scientific and engineering personnel to technical endeavor. It is intended to minimize their use in routine administrative and technical support activities.

OCRD manpower management surveys take into account all factors which contribute to workload and thus requirements for manpower. They are not mere "counts" of people to determine whether or not they are busy, but are a careful evaluation of the reasons why the work exists.

The importance of conducting a careful and thorough examination of all factors contributing to manpower requirements may be illustrated best by the fact that salaries of the civilian RDT&E work force in the Technical Services total, as stated earlier total upwards of \$200,000,000 annually.

Related costs for facilities, travel and equipment, and support of the 10,000 plus military personnel in

RDT&E of the Technical Services make the manpower bill the greatest single cost item in the in-house effort.

"Aside from the need to conserve the Army's scarce scientific and engineering resources," stated James P. Jordan, Chief of the Manpower and Personnel Division, OCRD, "it is obvious that manpower costs must receive constant attention if we are to make the best possible use of RDT&E funds."

In furtherance of this philosophy of manpower management, and in order that survey findings may provide comprehensive information to the field and the Chief of Research and Development concerning the status of overall R&D management, the following major areas are evaluated:

- **Personnel.** In the personnel area, the surveys evaluate: workload; ratio of support personnel to professionals; the utilization of scientific and engineering personnel; the relationship of overtime to manpower needs; and expenditures for travel.

- **Organization and Procedures.** Organization structure is evaluated to: identify undue layering of review functions and personnel; consolidate overly fragmented responsibilities; strengthen relationships between supervisors and bench scientists and engineers; more closely integrate responsibility with authority; streamline reporting channels; and, in some cases, to advise the commander on the effectiveness of commodity oriented organization versus a functional arrangement.

- **Programs and Budget.** In reviewing the financial picture, the surveys inquire into: the source of funding of various projects; relationship of present and future funding program changes anticipated; reporting program changes anticipated; reporting procedures; and financial controls and accountability.

- **RDT&E Projects and Tasks.** Based primarily on the advice and assistance of OCRD personnel responsible for the technical aspects of R&D, projects and tasks are examined. This examination is devoted to: priorities assigned; advantages of accomplishing the task or project in-house rather than by contract; extent of duplication or overlap with other projects and/or installations; consideration of the lead-time problem (AR 11-25); review of schedules for the accomplishment of short and long-range goals; approval level for tasks; and suitability of facilities and equipment.

"In the first year of R&D Manpower Management," Mr. Jordan said, "there is positive evidence that many improvements in the use of RDT&E manpower are feasible. It is felt that through the cooperation and assistance of R&D personnel at all levels of our laboratories, arsenals and agencies, scarce manpower resources can be conserved and used so as to derive maximum benefits to National Defense."

ACHIEVEMENT AWARDS

Maj Gen R. T. Nelson, Chief Signal Officer, presented a Certificate of Achievement to Lt Col Thomas S. Schreiber, his Executive Officer, when the colonel was reassigned as Chief of the Communications Branch, Office, Chief of Research and Development.

The citation stated in part: "[His] . . . exceptional acumen and initiative were evident in his quick and accurate evaluation of complex problems confronting the Chief Signal Officer and in his positive approach to bringing about satisfactory solutions. . . . As personal representative of the Chief Signal Officer on many classified and complex projects, his superior judgment, outstanding intelligence and professional maturity were proven."

Development of a new method of evaluating fabric preservative treatments has resulted in awards for two employees of the U.S. Army Engineer Research and Development Laboratories (ERDL), Fort Belvoir, Va.

Vincent J. Bagdon and Samuel Shapiro described the method they developed in an article published in a scientific journal. For their accomplishment, the men were presented with certificates and \$100 each.

Both employees of the Materials Branch, Bagdon and Shapiro co-authored an article entitled "A New Burial Technique for Improving the Soil Burial Method of Evaluating Fabric Preservative Treatments."

Certificates awarded to the two employees stated, "The use of this method by other investigators will give a higher degree of reproducibility of data, and will permit various investigators to utilize each others data for comparative purposes. The contribution is important to all laboratories engaged in microbiological testing, both Government and industry. It is especially important in tropicalization of materials used in military equipment."

1,150 Attend Meeting On Reliability Control

More than 1,150 Department of Defense, Armed Forces, industrial university and research institute leaders participated in the Eighth National Symposium on Reliability and Quality Control, Jan. 9-11, Washington, D.C.

Senator Henry M. Jackson, scheduled to speak at the conference banquet, had to revise his plans. Pinch-hitting for him was Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen, who discussed Army-industry R&D relations. Dr. Robert C. Seamans, National Aeronautics and Space Administration, led a panel in discussing "Reliability—The Key to Space Operations."

The keynote address, "A Management Appraisal of the Reliability Challenge," was presented by Charles F. Horne, President, General Dynamics—Pomona.

Presentations were made also by representatives of many of the Nation's leading industrial firms, including The Martin Co., Sandia Corp., Minneapolis Honeywell, Hughes Aircraft Co., International Business Machines Corp., Corning Glass Works, Lockheed Missile and Space Co., Texas Instruments, Sperry Rand Corp., Sylva Electric Systems, Boeing Co., International Electric Corp., Radio Corp. of America, AVCO Corp. and ELTEK Corp.

Army Announces Contracts Totaling More Than \$450 Million

Contract awards totaling more than \$450 million for research, development and procurement of military materiel were announced within the past month by the Department of the Army.

Two contracts aggregating \$111,757,956 were let to the Martin-Marietta Corp., Orlando, Fla., for continued work on the Pershing ballistic missile system.

The second largest contract was approximately \$28 million, awarded to Sylvania Electric Products, Inc., a subsidiary of General Telephone and Electronics Corp., for development of an advanced radar design for possible incorporation into the Nike Zeus antimissile missile system.

Production of 24 HC-1B Chinook Army transport helicopters is the basis of a \$25,645,000 contract awarded to the Vertol Division, Boeing Airplane Co., Morton, Pa.

Four contracts totaling \$25,278,198 for electron tubes, radar illuminators and field maintenance test equipment shops for the Hawk missile system were awarded to the Raytheon Co., Lexington, Mass.

Three contracts totaling \$26,382,141 were let to Continental Motors Corp., Muskegon, Mich., for engine assemblies for the M-60 tank, M-88 tank recovery vehicle and M-48-A-3 medium tank. Production of 405 M-60 tanks is called for in a \$15,414,000 contract given to Chrysler Corp., Centerline, Mich. Allison Division of General Motors Corp., Indianapolis, Ind., received a \$3,802,950 contract for M-60 tank transmissions.

FMC Corp., San Jose, Calif., has a \$20,671,700 contract for production of 1,500 M-113 armored personnel carriers. A \$9,634,237 contract for production of 5,600 ¼-ton trucks went to Ford Motor Co. The White Motor Co. was awarded a \$7,024,308 contract for 2,000 2½-ton trucks.

Three contracts totaling \$14,232,162 let to the Western Electric Co. call for engineering services, guidance control devices and training manuals for the Nike Hercules guided missile system. A \$5,804,435 contract let to Douglas Aircraft Co. is for production of Nike Hercules components. Western Electric also was awarded a \$12,376,800 contract for Nike Zeus R&D.

The \$13,134,800 contract let to Aircraft Armaments, Inc., Cockeysville, Md., requires modification of training devices for the Nike Hercules.

Production of missiles propellants is the basis of a \$13,070,725 contract

awarded to the Hercules Powder Co., Wilmington, Del.

A \$16,000,000 classified work contract was let to Burroughs Corp., Detroit, Mich. Other classified contracts included: Minneapolis Honeywell Co., Hopkins, Minn., \$8,875,192; Philco Corp., Philadelphia, Pa., \$8,000,000; Mason & Hanger-Silas Mason Co. Inc., New York, N.Y., \$9,573,364; Western Electric Co., \$2,000,000; AVCO Corp., Richmond, Ind., \$6,863,787; Ingraham Co., Bristol, Conn., \$3,773,931.

The Remington Arms Co., Inc., Bridgeport, Conn., was awarded a \$7,203,606 contract for small arms ammunition. Aerojet-General Corp., Downey, Calif., received a \$4,748,610 contract for 105 mm. shell components. A \$1,939,350 contract to Norris-Thermador, Los Angeles, Calif., is for M-55 chemical rockets. Firestone Tire & Rubber Co., Akron, Ohio, was awarded a \$1,959,370 contract for 90 mm. shells and a \$1,236,750 classified contract.

Caterpillar Tractor Co., Peoria, Ill., received a \$13,133,831 contract for production of 389 tractors. A \$5,712,713 contract to Clark Equipment Co., Benton Harbor, Mich., is for production of 355 scoop loaders.

Aerojet General Corp. was awarded a \$5,010,070 contract for loading, assembling and packaging of Hawk air defense guided missiles motors.

Land-Air Inc., Chicago, Ill., received a \$5,021,420 contract for collection of missile in-flight data and

\$850,000 for R&D of range instrumentation equipment at White Sands Missile Range, N. Mex. Telecomputing Services, Inc., Northridge, Calif., was granted a \$1,932,634 contract for missile data reduction service at WSMR.

Sperry Utah Co., a division of Sperry Rand Corp., received a \$3,600,000 contract for engineering services on the Sergeant guided missile system.

Harrison & Richardson, Inc., Worcester, Mass., received a \$7,626,855 contract for production of the Army's new M-14 rifle, increasing to \$18,126,855 the total the firm has been awarded since May 1961 under a letter contract for 133,000 rifles.

Additional contracts awarded in recent weeks included: Chrysler Corp., \$1,020,210 for support services for the Redstone missile system; Hiller Aircraft Corp., \$1,144,401 for 17 H-23F helicopters; Hayes Corp., \$1,818,573 for 18 Pershing missile trainers; Raytheon Co., \$1,112,800 for parts, components and material in support of the NATO Hawk missile program; Hughes Aircraft Corp., \$2,623,267 for helicopter transportable equipment to coordinate the firing of air defense missile batteries; Amelco of Los Angeles, \$2,654,660 for radio receivers and ancillary items; Raytheon Co., \$1,400,000 for the ARPAT project; Hughes Aircraft Co., \$1,143,835 for equipment to test printed circuit cards in the missile monitor system.

ERDL Scientist Heads New NATO Advisory Group

Edward E. Firth, an employee of the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va., has been elected chairman of a newly formed NATO Technical Advisory Working Group on Infrared and Image Intensification.

This newly established group pools the talents within NATO countries by bringing together industrial leaders and Government experts in the fields of infrared, electronics, and optics. It will provide technical advice to the NATO Armaments Committee on equipment standardization, coordinated production, and mutual or shared development programs in these specialized fields of endeavor.

In addition to Government representatives from a majority of the NATO countries, managers and technical personnel from leading industrial concerns in the United States, the United Kingdom, Netherlands, France, and West Germany will par-



Edward E. Firth

ticipate in meetings of the new group.

Mr. Firth is Chief of the Electronics Equipment Section, Electrical Engineering Branch. For the past five years, he has been the U.S. delegate serving with NATO experts in related fields. He has been with the Laboratories since 1948.

TRECOM Plans 'Copter Crash Tests to Study Safety

In an extension of its aircraft crash injury research program (See May issue, page 12), the Army plans crash tests of a pilotless remote-controlled transport helicopter late this summer at Phoenix, Ariz.

In preparation for the tests, an obsolescent tandem rotor Army helicopter is being converted into a pilotless drone aircraft by Kaman Aircraft Corp., Bloomfield, Conn. Research under Army contract is being conducted by the Flight Safety Foundation, New York, N.Y.

In simulated crashes over the past two years, two H-13 and three H-25 type helicopters, fully instrumented to provide test data, were dropped from the boom of a slow-moving crane. However, the realism of a true crash, which would involve higher speeds as well as hot components and rotating rotor blades, was absent.

Free-flight operation of the drone vehicles used in the tests will not

entirely eliminate these problems but will permit wider latitudes of operation, including crash landings in rough terrain, water and wooded sites. The full-scale crash test, using airborne electronic recording devices, will concern itself both with crash injury and post-crash fire factors.

The significance of the Army's crash injury research program lies in the ultimate application of its findings to the specific problems of civilian as well as military aviation. Findings from the series of tests could well lead to improvements in structural design of helicopters and VTOL (Vertical Takeoff and Landing) and STOL (Short Takeoff and Landing) aircraft of the future.



Crewman installs AN/ASW-12 navigational coupler into AO-1 Mohawk.

Automatic Device Regarded As Boon to 'Copter Pilots

An automated flight control device termed a "revolutionary advance" in relieving helicopter pilots of the need of operating five controls in flight has been delivered to Army field units, it was announced Jan. 18.

Designated the AN/ASW-12, developed under an Army Signal Corps \$2.5 million contract with Sperry Phoenix Co., and service-tested by the U.S. Army Aviation Board, the system is regarded as a major advance toward all-weather, day-and-night military and civilian helicopter use.

Designed to be sufficiently reliable, flexible and low in cost to make it adaptable to most conventional commercial aircraft, the AN/ASW-12 permits automatic landing approaches when electronically coupled to existing instrument landing systems.

The entire Army aviation crash injury research program is under the supervision of the U.S. Army Transportation Research Command, Fort Eustis, Va. Tests will be carried out at the Flight Safety Foundation's Aviation Crash Injury Research Division at Phoenix.

SAE Considers Analysis Of Gas Turbine Program

"The Army-Navy 600 hp. engine development program, by emphasizing the importance of the concept of component development, will provide the most advanced small gas turbine ever developed."

That statement was part of a joint analysis of the state-of-the-art of the Army-Navy 600 hp. Gas Turbine Development Program presented last month at the Automotive Engineering Congress. Held at Detroit, Mich., it was sponsored by the Society of Automotive Engineers.

The presentation was prepared jointly by Lt Col Roy Rayle, U.S. Army Ordnance Corps, Gilman L. Graves, Jr., and Anthony F. Johnson, Department of the Navy, Bureau of Ships.

The 600 hp. program was developed early in 1960 by the Office of the Chief of Research and Development, Department of the Army, and the Navy Bureau of Ships to coordinate efforts needed to meet requirements for gas turbine engines. A 6-point development program extending over a 3-year period is planned.

The Navy's interest in developing an advanced gas turbine is based on the needs of future surface anti-submarine warfare craft, hydrofoils, minesweepers and amphibious vehicles. The Army has a need for a similar engine, particularly for tank application.

By coordinating the Army and Navy requirements, the preliminary specifications for a light, compact, low-fuel-rate engine were broadened to include requirements for cold starting capacity, fuel capacity, ability to ingest dust and salt spray, fording capability and low waterborne noise.

These provisions, which broaden the military application spectrum, will result in sharing of a nominal increase of development costs and lower final unit production costs.

"By emphasizing the importance of component testing and development," the presentation stated, "the critical or high-risk elements of the engine design, such as the regenerator, can be resolved prior to getting into the more expensive engine test program."

The presentation summarized the general feasibility considerations of the program, including high-temperature materials, compressor and turbine performance, application requirements, specific fuel consumption, reliability and maintenance, installation considerations, compactness, weight, cost, auxiliary power, acceleration and rating standards.

SCAN System Hailed As Important Advance

Development of a new automatic communications system, known as the Switched Circuit Automatic Network, or SCAN, was announced last month and hailed as a breakthrough in military communications.

Communications engineers and technicians from the Army Signal Corps and the Bell Telephone System designed SCAN to operate as an element of the Defense Communications System. SCAN combines and automates several manually operated systems. It is capable of handling three types of services—voice, data and facsimile. Teletype is to be added.

The SCAN network has circuits running through four large switching centers located away from target areas in different regions of the U.S. It is an integral part of the Army's Strategic Communications System, serving commands in 70 foreign countries.

Maj Gen R. T. Nelson, the Army's Chief Signal Officer, explained that the modern Army needs a communications system that is "responsive" to the voice of command for administrative and logistic information required in support of command decisions.

"The ideal system would have to be completely automatic, able to carry any type of signal, and be accessible from any point on the globe," he said. "The SCAN network is a giant step in that direction, since, for the first time, it gives the Army an integrated user-to-user service within the continental United States."

Questions, Answers Trace Objectives of Army Reorganization

Information prepared on the reorganization of the Department of the Army for press and industrial briefings, in the form of a questions and answers presentation, duplicates in many instances the general news story report beginning on page 1. Additional information is contained, however, in the following selection:

Q. How will the implementation of the reorganization take place?

A. Implementation will take place over a period of at least 18 months. During this period, there will be three major phases; planning, activation, and modification of internal structure in preparation for full operations. There are many detailed tasks to be performed; such as reassignment of individuals, both military and civilians; selection and preparation of sites for the new headquarters; and readjustment of programs, budgets and funding arrangements within the entire structure. . . .

Q. What effect will the reorganization have on decision-making at the Department of the Army level?

A. Decision-making at the Department of the Army level will be greatly facilitated by the reorganization. In fact, this is one of our primary objectives. By divesting the General Staff of its day-to-day operational activities and enabling it to concentrate on long-range planning and policy decisions, the entire command structure should benefit.

Q. The reorganization places great emphasis on increased automation of Army procedures. What is the order of magnitude anticipated in the use of automated procedures? To what Army activities will they be applied?

A. Automation will continue to be implemented wherever feasible under the new organization plan. Detailed studies are currently underway to determine the best possible ways to integrate automated procedures in the fields of personnel administration and assignment; budgeting, funding and reporting; intelligence; and supply and inventory management.

Q. What effect will the reorganization have on Army responsibility and operations for civil defense, natural disaster and emergency support to civil authorities?

A. None.

Q. What are the order of magnitude costs for affecting the change to the new organization? What anticipated dollar savings will accrue after the reorganization is completed?

A. Dollar costs for effecting the complete reorganization will depend to a large extent on the results of de-

tailed planning which has not yet been undertaken. However, by making some broad assumptions, we can arrive at an approximation of the cost. If we assume that the new commands will be activated in place (where most of the activities now exist), an order of magnitude estimate of the cost is about \$11 million. Dollar savings are expected to accrue as a result of the reorganization. These savings will be realized in the form of increased effectiveness and better utilization of our national defense resources.

Q. Is the Army's reorganization patterned after the Air Force's new organizational structure?

A. No. While the Army's reorganization plan, in some respects, resembles the Air Force command structure, it was not patterned after it. It is tailored to support the needs of the Army and the ground combat forces. The reorganization is based on a detailed study conducted by a group of some 60 Army military and civilian personnel over a period of approximately eight months.

Q. What changes in the command relationship and in the assignment of major headquarters and units to installations in CONUS are entailed by the reorganization? In overseas areas?

A. The major changes of assignment involving major headquarters within the CONUS are as follows:

USCONARC will gain three Class II installations; namely Fort Belvoir, Fort Eustis and Fort Lee in Virginia. It also will gain the Army Training Centers located at Fort Gordon, Ga., and Fort Sam Houston, Tex., and 17 schools formerly under the command of the Technical Services. The location of these installations and their mission will remain unchanged.

The Combat Developments Command will gain the Combat Development agencies, which formerly came under the control of Hq USCONARC, the Technical Services, and agencies of the General Staff of the Department of the Army. The location and mission of the Combat Development Experimentation Center at Fort Ord, Calif., remain unchanged.

The Materiel Development and Logistic Command will gain all of the Class II activities and installations from the Technical Services. The location and mission of these Class II activities will remain substantially unchanged.

The location of the Headquarters, Combat Developments Command and the Headquarters, Materiel Develop-

ment and Logistic Command has not been determined as yet.

Overseas areas will not be affected. **Q.** During the transition period, what is the anticipated effect on the Army's efficiency? Can a temporary lowering of the Army's combat effectiveness be expected? If so, can we afford this situation during the current international tenseness?

A. The Army's efficiency during the transition period will be maintained at its current high standard. There will be no lowering of combat effectiveness. Overseas commands and Army components of unified and specified commands within the Zone of Interior, such as STRICOM, will not be affected by this reorganization. We could ill afford, in the face of the current international tenseness, to reduce in any way our capabilities to meet any threat.

Q. How will the reorganization affect Army relationships with unified commands and the Joint Chiefs of Staff?

A. Army relationships with unified and specified commands and with the Joint Chiefs of Staff will not be directly affected by the reorganization. However, the concentration of training responsibilities in CONARC, materiel responsibilities in MDLC, and personnel responsibilities in OPO will enable the Army to respond more directly and effectively to requirements of unified commands. It also will simplify the dealings of those commands with the Army.

Q. Except for the Combat Developments Command and the Materiel Development and Logistic Command:

a. Will Army installations be opened or closed as a result of the reorganization?

b. Will any existing installations be materially expanded or reduced?

A. a. As a direct result of this reorganization, no Army installations will be closed. New commands will be created, but it is not anticipated that the creation of these commands will cause the opening of any new installations.

b. Because of the new command structure, certain existing installations will be expanded in terms of personnel and facilities.

Q. Will the reorganization have any direct effect upon personnel and functions at Class I and Class II installations? At CONUS Army and Corps Headquarters?

A. Personnel and functions at Class I and Class II installations will, ex-

(Continued on next page)

Q&A Information Clarifies Responsibilities, Procedures of Reorganization

(Continued from page 9)

cept in a small percentage of cases, be little affected by the reorganization. Likewise, the CONUS Armies and Corps Headquarters will not be affected.

Q. What effect will the reorganization have on Army schools?

A. Almost all Army schools will be under the control of USCONARC with the largest exception being the Army Logistics Management Center at Fort Lee, Va., which will be assigned to the Materiel Development and Logistic Command. The schools will no longer be responsible for the preparation of current doctrine, such as Field Manuals and Tables of Organization and Equipment, since that function will be a responsibility of the Combat Developments Command.

Q. The rearrangement of the Technical Services and other changes makes an addition to the number of major subordinate commands. Doesn't this increase the span of control for the Department of the Army and make overall supervision more difficult?

A. Under the present system, there are seven Technical Services reporting directly to the Chief of Staff through the Deputy Chief of Staff for Logistics and the Chief of Research and Development. Under the proposed organization, there are only five development and production commands reporting to the Commanding General of the Materiel Development and Logistic Command. Therefore, we have one new major command reporting to the Department of Army Headquarters instead of seven as under the current organization. As for overall supervision, there are two new commands created by this reorganization. However, the consolidation of functions and the clear lines of responsibility for these functions should facilitate control and supervision.

Q. What will be the probable effect of the reorganization on the morale, esprit, and traditions of the Administrative and Technical Services?

A. The final effect brought about by the changes should result in higher morale and esprit within the entire Army. The Administrative and Technical Services are justly proud of their long histories which are filled with accomplishments of great magnitude. The tradition which is theirs can never be taken from them. The functions which they have performed over the years will continue. While it is true that there will be some rearrangement of these functions, the branches themselves will remain

and most of the services are continued at the Department of the Army staff level.

Q. What are the major functions left with The Adjutant General? Is this sufficient to justify a separate branch?

A. The major functions remaining with The Adjutant General are those of internal record-keeping and administration. While The Adjutant General's functions will be greatly reduced, his remaining responsibilities are of a continuing and vital nature to the overall operation of the Army. A large segment of The Adjutant General's personnel will come under the Office of Personnel Operations.

Q. What effect will the consolidation of personnel management have upon the following:

a. Money and personnel savings?

b. Career programs of individual officer, enlisted and civilian personnel?

c. Assignment and utilization of personnel?

d. Procurement and retention of career personnel, civilian and military?

A. This question cannot be answered realistically until detailed planning has been accomplished. Twenty DA Staff agencies are now involved in personnel management operations. Some savings will be possible by consolidation of the personnel operations; however, there are many areas wherein the saving will be offset by the requirement for people to perform a job that is not now being accomplished to the degree required. This has specific application in the case of enlisted personnel. . . .

Q. What effect will the reorganization have on the effort and progress made in recent years to render more personalized service in personnel management activities?

A. The underlying philosophy of the OPO concept is to continue the personalized service in personnel management activities. The goal will be to attain for all branches the quality of management and personalized attention now enjoyed by personnel in the branch considered the best in this regard. The branch assignment sections will retain their identity in OPO and will continue to be staffed by appropriate branch personnel. . . .

Q. What will be the effect of the reorganization on the Army's grade structure: officer, enlisted and civilian?

A. This question has not been explored in detail and again can be

answered realistically only after we have gotten into our detailed planning. However, no appreciable effect on the grade structure is envisioned. Rather, there will be a shifting of some positions from one agency to another along with the shift of functions. It is not envisioned that there will be any major effect on the overall Army grade structure.

Q. How much movement of personnel can be expected? Where, when?

A. The major impact of the reorganization will fall on a few major headquarters (i.e., DA, CONARC) and on realignment of the command relationships. As a consequence, the bulk of movement of personnel will be from the Office, Deputy Chief of Staff, Logistics, and the offices of the Chiefs of the Technical Services, into the MDLC headquarters. The concept for transition visualizes a period of 18 months before the MDLC becomes fully operational. If any movement of personnel is involved, it will be on a gradual, phased basis. . . .

Q. Will combat arms officers be assigned to the Materiel Development and Logistic Command?

A. Yes. Inherent in the proposal for the overall reorganization is a greater singleness of purpose and unity of effort through better integration of personnel possessing tactical, technical and administrative backgrounds in all of the major commands. This integration of personnel will provide increased competence to accomplish the tasks involved in each major command. Also, the closer association of personnel of all branches will afford an enlightend perspective for personnel throughout the Army and will foster an improved institutional environment.

Q. Will Technical Service personnel be assigned to the Combat Developments Command?

A. Yes, as in the case of the other major commands, MDLC and CONARC, Technical Service personnel will be assigned to the Combat Developments Command. Since the Technical Services have combat development and doctrinal responsibilities under the existing organization, it is vital that technical personnel be included in key positions of the CDC organizational framework.

Q. What effect will the broad program of cross-utilization of officers have on technical proficiency and branch qualifications?

A. These two terms are not mutually exclusive in the current environment although they might have been so considered a few years ago. Many

of the branch qualified officers reflect training and experience in duties outside of those normally associated with the branch. For example, branch qualified personnel are frequently required to fill such positions as controllers, aviators, key logisticians and R&D specialists. The trend, then, indicates that the branch qualified officer will have proficiency in one or perhaps more of these areas in the years to come. The branch qualified officer of the future will probably be one whose range of knowledge and experience includes one of the areas which we now tend to think of as a specialty.

Some of the officers' career patterns will reflect a broadening to include some of the specialties; at the same time, the technically proficient officer will still be needed, perhaps more so than ever, because of the increasing complexity of the current defense environment. It appears that the technician will require a greater degree of specialization and a greater depth of knowledge in the "true" specialties than has been required.

Under the OPO concept, both categories of officers can better be accommodated than is permitted by the current organization. By the same token, the officer career programs can be better designed to keep pace with requirements of the changing defense environment.

In sum, the reorganization will provide greater attention for the technician and through increased cross-utilization will enable the so-called generalist to gain experience in what heretofore have been regarded as specialties.

Q. How will the reorganization affect opportunities for attendance at service schools for administrative and technical service officers, for other specialists, and for combat officers?

A. The reorganization visualizes an increased opportunity for the more capable officers, regardless of branch, to be selected to attend service schools. The important things in this area is that consideration for service school selection will increase emphasis on individual skill and ability along with the experience and potential which the officer possesses in the light of current and future Army requirements. Officers of the technical and administrative branches will have an increased opportunity to serve in challenging and broadening positions, particularly in top management positions, thereby enhancing their chances for school selection and promotion. By the same token, the importance of the officer specialist in the modern Army dictates that such officers—

President's Federal Pay Panel Recommends Reform

Deep concern over "the inadequate compensation paid to Federal civilian employees, and especially to those bearing senior responsibility," was expressed last month by President Kennedy's special panel on the Federal pay system.

The panel made a preliminary report to the President saying that reform is particularly needed in grades GS-12 and above. Appointed on Dec. 28, the panel reached agreement at a meeting early in January that:

"... The Federal Government should take steps promptly to insure that employees from lowest levels to the senior ranks should receive compensation comparable to that of employees in non-Government jobs doing like work."

William Lehman of the Bureau of the Budget told the panel of "present inadequacies of the Federal civilian pay systems and the proposals that have been developed to overcome these shortcomings.

In its report to President Kennedy the panel stated:

"It is clear to us that reform of prevailing compensation arrangements is urgently required, and this, we believe, is particularly true of the compensation of officials in the upper levels, that is, grades GS-12 and above and equivalent level in the other pay systems."

As reported in the January issue of this publication, the disparity in salaries paid to Federal employees and to non-Government employees doing like work, as based on findings of the U.S. Bureau of Labor Statistics and the U.S. Civil Service Commission, is expected to have an important influence in appeals to Congress for Federal pay system reform.

although following different career patterns—not be penalized.

The OPO concept will better assure that officers of the technical and administrative branches and the officer specialists of all branches are considered in proper perspective. Unlike today, officers of all branches will serve to a greater degree than before in the Office of the Deputy Chief of Staff for Personnel and in OPO—apart from the branch assignment sections—where school and promotion programs are developed and implemented.

Q. How does the proposal envision that personnel of the Administrative and Technical Services will receive as careful and effective career management as they have been provided in the past by their respective service chiefs?

A. There are several assurances of this inherent in the proposed personnel management programs under the reorganization. First, the Office of the Deputy Chief of Staff for Personnel, which is responsible for developing general staff policy under which OPO will operate, will be staffed with officers of all branches.

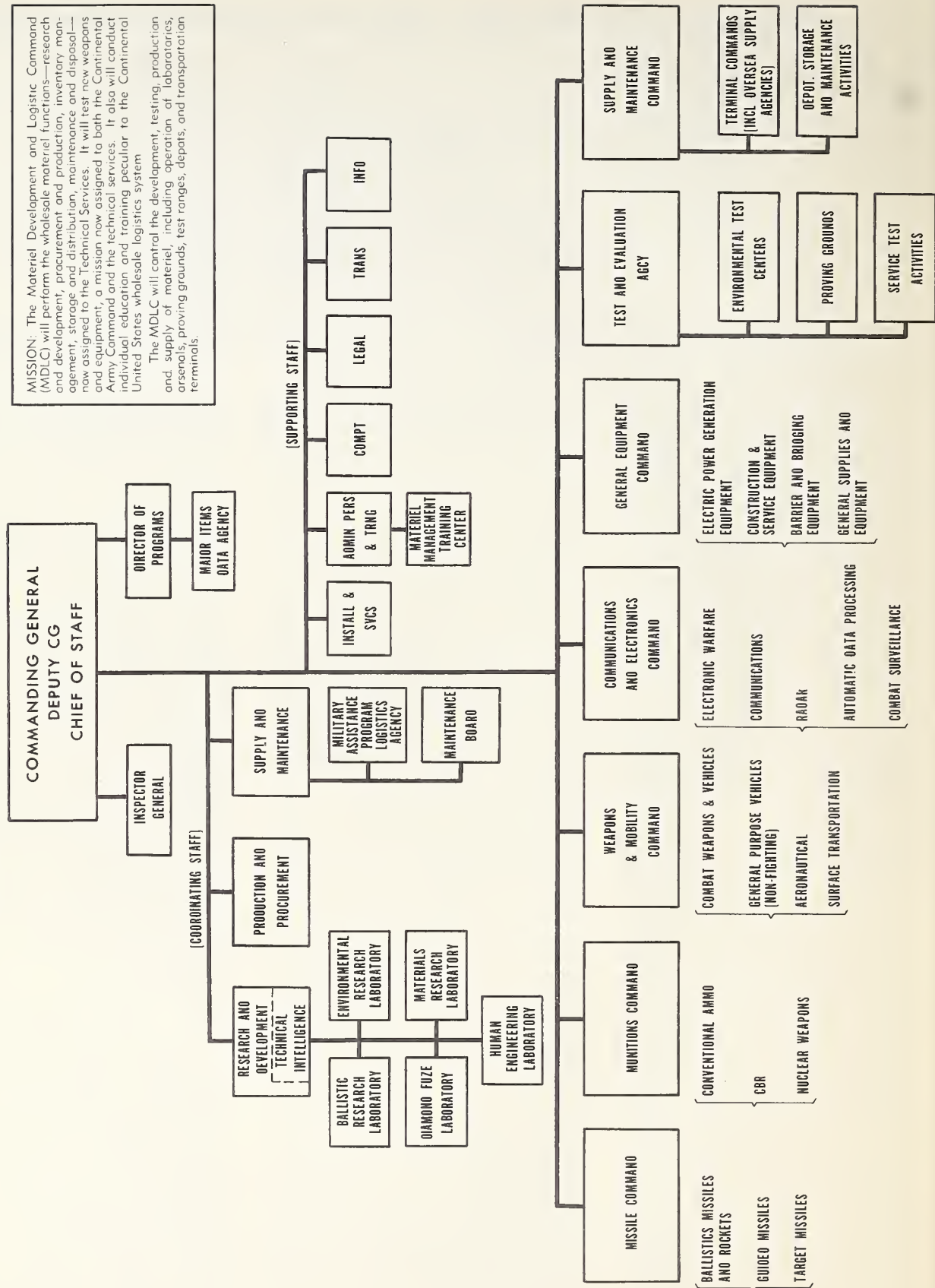
This is not true today, for ODCSPER is staffed almost exclusively with combat arms officers. By including technical and administrative service officers on the DCSPER staff, we also are including knowledge of the problems in the technical and administrative branches and consequently building into the organization an improved competence to visualize needs and to manage the total Army personnel system.

In OPO, the Officer Branch Assignment Sections now included in the offices of the Chiefs of the technical and administrative services (except AMEDS, JAGC officers and Chaplains) will retain their identity and be included in OPO. Each Branch Assignment Section will be staffed by appropriate branch personnel and continue to manage officer personnel of their respective branches.

Apart from the Branch Assignment Sections officers of all branches will be integrated in OPO, again to provide the competence to cope with the full range of Army personnel problems and requirements. Key positions in ODCSPER and OPO will be filled by general officers and other senior officers of all branches. Such a mix of officers promises a better understanding of all branch problems. Hence, enlightened and more effective management of the Army personnel system are assured.

Under the OPO concept, each Officer Branch Assignment Section will be organized into manageable, homogeneous control groups, according to similarity of career patterns, and will be headed by a general officer. Thus, all branches will be equitably represented and effectively managed.

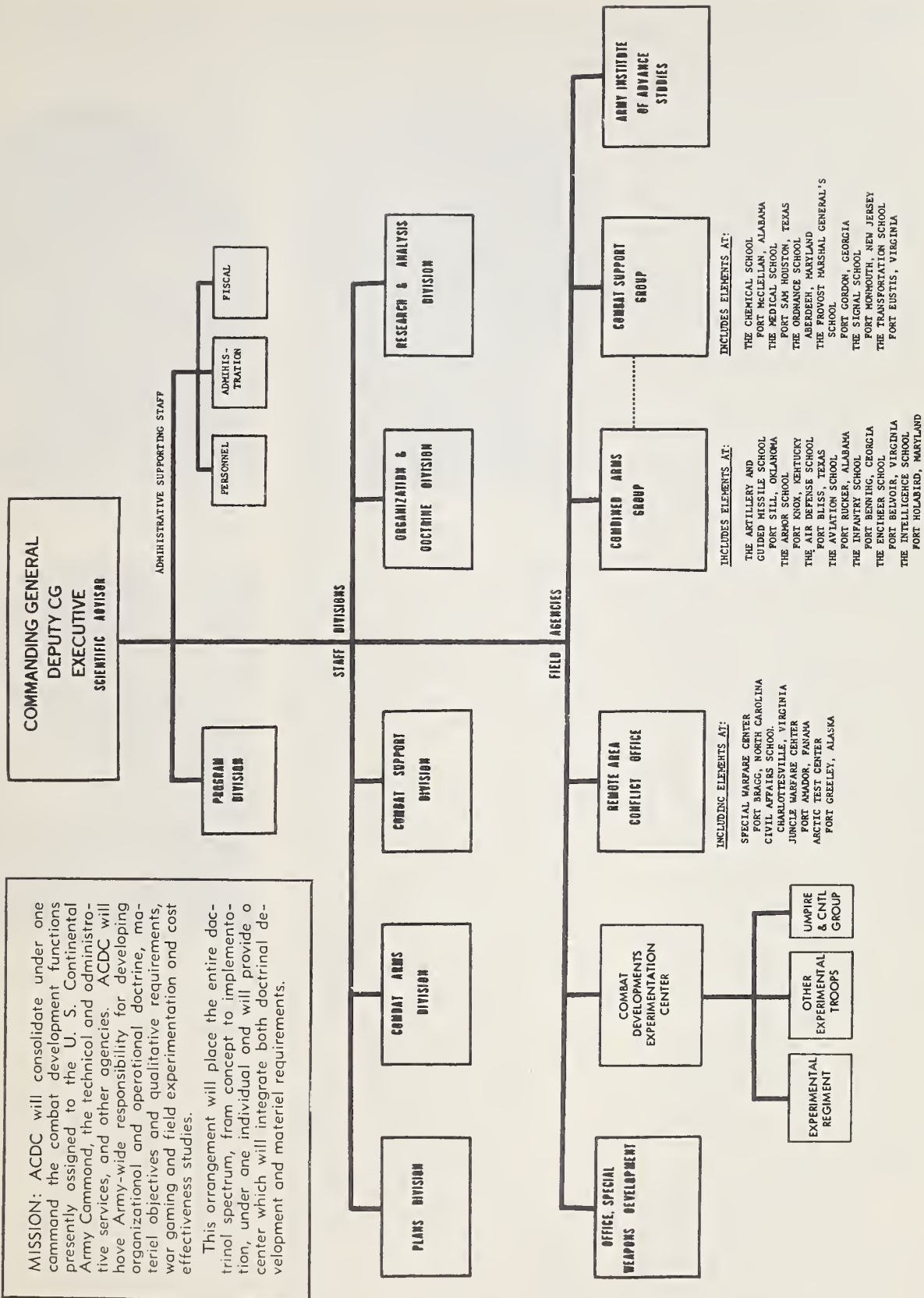
It is visualized that when the DCSPER is a general officer with a combat arms background, the Chief OPO will be a general officer who has risen through the technical or administrative services. This will insure that our personnel system retains a balanced perspective and is oriented toward the entire officer corps.



CONCEPT OF U.S. ARMY COMBAT DEVELOPMENTS COMMAND

MISSION: ACDC will consolidate under one command the combat development functions presently assigned to the U. S. Continental Army Command, the technical and administrative services, and other agencies. ACDC will have Army-wide responsibility for developing organizational and operational doctrine, materiel objectives and qualitative requirements, war gaming and field experimentation and cost effectiveness studies.

This arrangement will place the entire doctrinal spectrum, from concept to implementation, under one individual and will provide a center which will integrate both doctrinal development and materiel requirements.



QM Research Seeks Improved Personnel Armor Materials

By Meyer I. Landsberg & Anthony L. Alesi, Quartermaster Research & Engineering Center

The mention of armor perhaps suggests the thought of a knight on horseback. With this, there may also be formed a mental picture of how those combatants of antiquity would have fared had they been pitted against modern arms and tactics. Yet the knight has left a legacy to today's military. Despite a long period of absence from the battlefield, the use of armor for the individual soldier (personnel armor) is steadily increasing. The various items now in use will probably be with us for a long time, before joining the plate and chain mail coverings of the knight as museum pieces.

At the beginning of World War I, none of the armies involved had any protective armor. One incident—involving a metal bowl worn under a soldier's cap which, when struck by a rifle bullet, protected him from injury and possible death—led to the revival of modern armor. This circumstance, against a background of heavy losses from artillery fire, provided the inspiration to a French general to issue metal protective headgear to his troops. Soon all the armies were equipped with metal helmets as essential combat gear.

In World War II, our bomber crews donned metal helmets and body armor to reduce the high and rapidly mounting casualties from antiaircraft fire.

During the Korean War, when massed waves of enemy troops in close combat fighting used grenades and mortar and automatic arms fire with telling effect, infantrymen were forced to wear armor vests.

A future war would find the infantry soldier wearing an improved helmet and armor vest, and possibly armored clothing to protect his arms and legs. Army aircraft crewmen would be wearing crash and ballistic protective flight helmets and body armor. In addition, the aircraft may be equipped with armor which could be retained or removed, depending upon the mission. Tank crewmen would have a protective tank helmet and body armor. Troops clearing minefields may wear a complete suit of armored clothing.

Modern experience with personnel armor has shown that its use reduces casualties significantly. In addition, it lessens the severity of wounds caused by missiles of sufficient weight and velocity to penetrate the armor. The reduction in wound severity may enable the soldier to continue to carry out his immediate mission, a critical factor in any battle situation. In



Laminated nylon liner is ballistic resistant and will replace cotton duck.



Standard eye armor, M-14, made of same Hadfield steel as the helmet.

addition, a reduction in wound severity means a faster recovery and earlier return to combat duty.

The overall result is a much greater possibility of maintaining our fighting forces at maximum strength.

The Importance of Materials. The modern revival of the principles of ancient armor was made possible by the introduction of new materials capable of coping with the weapons and munitions in use. Helmets and body armor provide only the protection inherent in their materials. Personnel armor had fallen into discard for centuries because materials development failed to keep up with weapons development.

The helmets worn during the first World War were made possible by the prior development of tough, hard, formable steels such as manganese and other alloy steels. Nylon, glass fiber and polyester resins—all materials developed shortly before or during the second World War—were used in armor items worn in World War II and the Korean War.

The Changing Hazard. Although the armor vests worn in Korea stopped three-fourths of all projectiles which struck them, saved many lives, and reduced the severity of wounds, the Army recognized that even greater protection was needed. It was also aware that weapon developments that were certain to come would make this armor less effective.

Weight vs. Protection. An obvious solution to the problem of gaining greater protection may appear to lie in the use of a greater amount of



An experimental armor vest used in Korea stopped three-fourths of projectiles, saved many lives. Greatly improved vest is being evaluated (See January 1962 issue, page 11.)

armor thickness. This is not practical for two reasons. First, the soldier would find it physically impossible to carry any substantial increase in his present combat load. Second, the increased bulk would seriously restrict his freedom of movement and interfere with his ability to carry out a combat mission.

Since weight is such an important factor in helmets and body armor, the weight per unit area or areal density is severely restricted. For example, the areal density of the standard Army armor vest is approximately 20 ounces per square foot. The

"heaviest" standard item is the M-1 helmet shell with an areal density of 28 ounces per square foot. An idea of how little material this represents may be gained from its thickness,



Air crewman's reinforced plastic helmet equipped for radio communication, protects against crash, noise.

0.040 inch. The problem of developing better armor materials involves obtaining the most protection for the least weight per unit of area.

The weight per unit area is an important factor in selecting armor materials. Although penetration resistance increases with increasing areal density, the rate of increase varies with areal density and differs with the characteristics of the material used. A material with the greater resistance to penetration at one areal density may not be the better material at another areal density. Penetrating resistance will vary considerably with projectile size and shape.

This behavior shows why materials used for much heavier armor, such as tank armor, are not the most effective for personnel armor. Thick tank armor impacted by projectiles, whose diameter is of the same magnitude as the armor thickness or impacted by a high speed jet of minute particles from a shaped charge, reacts quite differently from thin personnel armor impacted by projectiles whose smallest dimension is usually larger than the armor thickness.

Armor Materials Program. Only research and development can provide the better armor materials of the future. The development of materials specifically intended for personnel armor is a necessity if the race between armor and weapons is not to be lost again as it was centuries ago. The Army has found that sole reliance on the normal course of industrial progress to make available ma-

terials that happen to possess effective armor qualities is not adequate.

At the end of the Korean War, the Quartermaster Corps, responsible for the development of helmets and body armor for the Army, started a long-range program of supporting research and engineering development to provide the improved materials it anticipated would be needed. This program, carried out under the QMC project for the development of personnel armor, was limited in scope in its earlier stages. As it progressed, work was expanded to include:

- Analytical and experimental studies of the mechanisms of penetration.
- Post-impact studies of projectile and target to determine deformation and changes in material structure.
- Evaluation and study of metals, textiles, ceramics, and plastics to determine effects of composition and processing upon ballistic resistance characteristics.

The combination of materials research and item development has resulted in an improved armor vest, and now items such as the nylon liner for the M-1 helmet, the combat vehicle crewman's helmet, and an armor ensemble for mine clearance personnel. In addition, progress is being made on developing flight armor, eye armor, flyer's helmets and an infantryman's armor vest using a composite system of metal plates and textile material.

What has been accomplished in personnel armor protection is based on what is known today of the behavior of certain materials when impacted by missiles of various shapes, and weights at various velocities. While these achievements are significant, they have further served to emphasize that present knowledge of penetration and of materials is still not adequate to gain further major improvements. More information is needed of penetration phenomena and the "why" of material behavior in terms of its structure and properties.

The Quartermaster Corps is seeking to expand its personnel armor materials program—a program needed to cope with the complexity and magnitude of the problem.

An adequate program of supporting research and engineering development will include (1) research to expand the knowledge of penetration phenomena and the structural parameters determining its material response, (2) research to determine how to fashion materials with the structure and properties found essential for maximum resistance to penetration, (3) empirical evaluation of

available materials, and (4) engineering application of present knowledge to obtain maximum performance from available materials.

The scope of this program encompasses experimental and theoretical endeavors in many scientific fields of physics, chemistry, mathematics, and engineering. Through this program, the Quartermaster Corps expects to develop the materials to fabricate the improved helmets, body armor, and special-purpose armor needed to protect the combat soldier from tomorrow's missile hazards.

29 R&D, AE Officers Named For 1962-1963 Courses at Armed Forces War Colleges

Nineteen officers enrolled in the Army Research and Development and Atomic Energy Specialists Program and 10 additional officers presently assigned to OCRD have been selected to attend 1962-1963 courses in Armed Forces War Colleges.

R&D and AE Specialists Program officers chosen and the institutions they will attend are:

NATIONAL WAR COLLEGE—Col Manrico P. DiFusco and Col Robert H. Offley, Artillery; Lt Col Howard H. Cooksey, Infantry; Col Spencer P. Edwards, Jr., Ordnance Corps.

ARMY WAR COLLEGE—Lt Cols Joseph T. Brown, John A. Chiment, Walter R. Harris, Franklyn J. Michaelson and William Teir, all Artillery; Lt Col Richard T. Lunger, Infantry; Col Charles S. Brice, Chemical Corps; Col Thomas H. Muller, Infantry; Lt Col Arthur T. Surkamp, Corps of Engineers; Col George D. Carnahan, Ordnance Corps; Lt Col Albion W. Knight, Jr., Signal Corps.

AIR WAR COLLEGE—Lt Col John T. Pierce III, Armor; Lt Col James J. Cobb, Artillery; Lt Col Winfield S. Scott, Ordnance Corps.

NAVAL WAR COLLEGE—Lt Col John W. Barnes, Infantry.

The 10 OCRD officers selected for schools but not enrolled in the R&D and AE Program are:

NATIONAL WAR COLLEGE—Lt Col George Sammet, Jr., Artillery and Col Elmer P. Yates, Corps of Engineers.

INDUSTRIAL COLLEGE OF THE ARMED FORCES—Lt Col Russel W. Ernst, Armor; Lt Col Frederick A. Smith, Jr., Infantry; Lt Col Lee B. Brownfield, Signal Corps.

ARMY WAR COLLEGE—Lt Col James R. Young, Infantry and Lt Col Peter G. Olenchuk, Chemical Corps.

NAVAL WAR COLLEGE—Lt Col Charles H. Curtis, Infantry; Lt Col Oran K. Henderson, Infantry; Col Robert W. Studer, Signal Corps.

Patents Knowledge Viewed as Useful Tool for R&D Personnel

Part 3 of 3 Parts

By Lt Col G. F. Westerman

(Sections 1 and 2 of this article, appearing in the December and January issues, discussed historical background of the Patent System, the Nature of Patent Rights, What Can be Patented, Special Patent Laws, Patent Limitations, Need for Patents, and How to Obtain a Patent.)

IN-HOUSE INVENTORS' RIGHTS. In return for the preparation and prosecution of his patent application, the service inventor is required to give to the Government a nonexclusive, royalty-free license under his invention. There is no other charge for this service.

If an inventor was either a member of the military service or a Government employee at the time the invention was made, the Government may already own or have an interest in his invention as a result of the circumstances of his duties. This is true whether he obtains a patent at Government expense or through the efforts of a privately retained patent attorney.

The rights of the Government and the inventor in inventions made by Government employees are determined in accordance with Executive Order 10096, Jan. 23, 1950, and Executive Order 10930, Mar. 24, 1961. The Department of the Army makes the Determination of Rights for its employees, subject to approval, in most cases, by The Commissioner of Patents. Broadly speaking, determinations are made in accordance with the following rules:

If the employee's duties or work projects—

- Were directly related to the invention, then the Government obtains complete title.

- Were not directly related to the invention, but the employee used Government time, facilities, materials, etc., then the employee keeps title, subject to a royalty-free license in the Government.

- Were not directly related to the invention and there was no Government contribution, then the employee keeps all rights.

In order that there will be no uncertainty as to the legal rights in a given invention, it is important to have this matter definitely settled. The best way to do this is through the regular procedure for determination of rights which is described in AR 825-20. A questionnaire eliciting information for determination of rights will be forwarded to you after it has been determined that the invention disclosure may be patentable, or upon receipt of information that you wish to retain a private patent attorney.

INFRINGEMENT. Infringement of a patent consists in the unauthorized making, using or selling of a patented invention within the territory of the United States during the term of the patent. If a patent is infringed, the patentee may sue for relief in the appropriate Federal Court. He may ask the Court for an injunction to prevent continuation of the infringement, and he may also ask for an award of damages because of the infringement.

However, in the event an inven-

tion covered by a patent is "used or manufactured by or for the United States," no suit lies against the manufacturer, but the patentee's sole remedy is a suit in the Court of Claims against the United States. This is to prevent patent owners from interfering with production by the Government or under Government contracts.

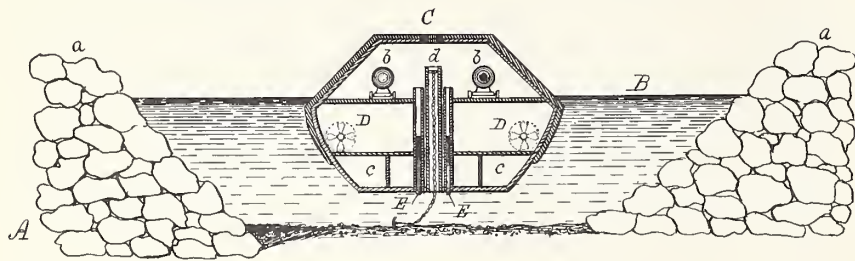
In an infringement suit, the defendant may generally raise the question of validity of the patent which is then decided by the Court. The defendant may also aver that what he is doing does not constitute infringement. Infringement is decided primarily by the language of the claims of the patent and, if what the defendant is making does not fall within the language of any of the claims of the patent, he does not infringe. Thus, if a claim were to read:

"A fountain pen comprising a hollow handle, a writing-fluid receptacle integral therewith, a ball-shaped writing point fixedly associated with one end of the handle opposite the receptacle, and an automatic fluid-control tube leading from the receptacle to the ball-shaped writing point," no infringement could possibly result unless the fountain pen had a ball-shaped point. It is fundamental patent gospel that each physical structure described in the patent claim actually exist in the article to be manufactured; otherwise there is no infringement.

So we see that infringement is determined by the precise language of the patent claims and not by a comparison of articles made by the patentee and a possible infringer. If one is able to make the patented device or to practice the invention with the omission of any element of the claim, he avoids infringement.

This leads to "designing around" or the development of equivalent inventions which avoid the claims of the patent. Some people cite this as a fringe benefit of the patent system—that it stimulates additional inventions in the effort to design around existing patents. The Patent Office has no jurisdiction over questions relating to infringement of patents. In examining applications for patent, no determination is made as to whether the invention sought to be patented infringes any prior patent. As previously pointed out, an improvement invention may be patentable, even though it might infringe a prior unexpired patent for the invention improved upon.

PATENT MARKING. Some per-



A novel fortification for coast and harbor defense was patented Sept. 27, 1887. The above system of batteries was used during the Civil War. A—Low silhouette was designed to minimize vulnerability to ironclads (such as the famed Monitor and Merrimac models), torpedoes, rams, or other navigable vessels. aa—Crest of defense. B—Waterline of coastal ditch or basin. bb—Guns were arranged so that when the vessel was raised from its submerged position for attack, they were less vulnerable to enemy guns. C—Battery vessel was designed with comparatively shallow draft, to be easily maneuvered within its canal or navigated to different localities. cc—Watertight compartments, which could be filled or emptied to raise the vessel for attack or lowered to shield it from attack. D—Propellers. d—Stationary axis. EE—False keel.

sons mark articles sold with the terms "Patent Applied For" or "Patent Pending." Neither of these phrases has any legal effect, but serves to notify competitors that if the patent is granted they will have to cease their use of the invention. It is not likely that producers will make use of an invention involving a costly outlay of tools and machinery, if the operation must cease as soon as the patent is issued. To this extent, the inventor may find the terms useful. False use of these phrases or their equivalents is prohibited.

When the patent issues, proper marking becomes a matter of vital importance. A patentee who makes or sells patented articles, or a person who does so under license from him, is required to mark the articles with the word "Patent" and the number of the patents. The penalty for failure to mark is that the patentee may not recover damages from an infringer unless the infringer was duly notified of the infringement and continued to infringe after the notice.

The marking of an article as patented when it is not in fact patented is against the law and subjects the offender to a penalty.

COPYRIGHTS AND TRADE-MARKS. Some persons occasionally confuse patents, copyrights, and trademarks. Although there may be some resemblance in the rights of these three kinds of intangible property, they are completely different and serve different purposes.

• **COPYRIGHTS.** A copyright protects the works of an author against copying. The scope of the copyright law includes all kinds of writings, musical compositions, works

Young Inventor's Mother Thanks Army for Bit of Aid

Army scientists and engineers, busy though they are, appreciate the importance of taking time to encourage many young aspiring scientists.

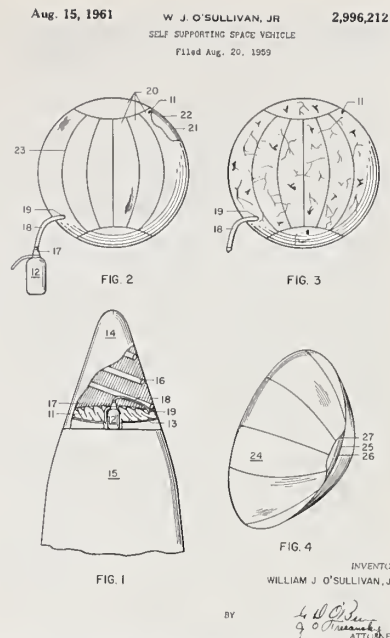
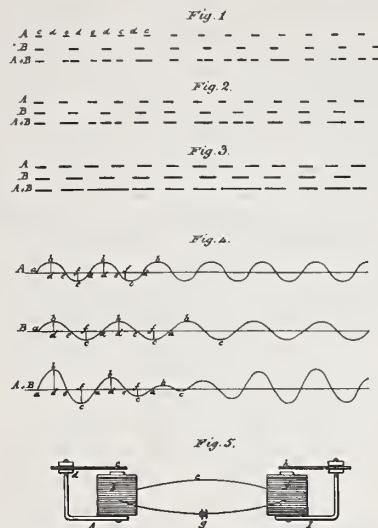
True, time available does not permit answering all or even a major portion of the thousands of letters sent by youngsters seeking information. But when a busy man somehow manages to find time to reply, he may be satisfied that the effort is worthwhile by an example such as follows.

A potential future scientist wrote for information on how to sell a "kind of machinegun that is powered by pistons." Charles E. McCabe, Chief of the Scientific Information Branch, U.S. Army Research Office, replied in part:

"We here in Washington are happy to know that the young citizens of our

2 Sheets—Sheet 1

A. G. BELL.
TELEGRAPHY.
No. 174,465. Patented March 7, 1876



A collection of patents on a specific subject traces the development of that field from its earliest beginnings to the present. Such is the span of technology linked by Bell's patent on the first crude telephone and the patent issued last August on the "Echo" communications satellite employing similar principles.

of art, and similar subject matter. The copyright simply prevents others from copying the creation of the author and goes only to the form of expression rather than to the subject matter of the writing. For example, a description of a machine could be copyrighted as a writing, but this would not prevent them from writing a description of their own or from making and using the machine.

A statutory copyright for 28 years, with a right to renew for another like term, is acquired by publication of

the work with a notice on the title page or page immediately following. In the case of published literary works, this notice consists of the word "Copyright," the abbreviation "Copr.," or the symbol (c), followed by the name of the copyright owner and the year date of publication. There is no provision in the copyright law, as there is in the patent law, for scrutiny of applications to determine questions of originality or authorship.

For another to practice without permission any of the exclusive legal rights granted to the copyright proprietor, such as copying, reproducing, translating, publishing, etc. is an infringement of the copyright and is punishable at law by award of damages to the copyright proprietor.

Even though a copyright is obtained simply by publication with the proper notice, a suit for copyright infringement cannot be brought until the work is properly registered with the Register of Copyrights in the Library of Congress. On Sept. 8, 1960, 28 U.S.C. 1498 was amended so as to permit suit against the Government for copyright infringement. Prior to this time, several employees of the Government had been held personally liable for their infringements, even though such infringements were done in the course of their official duties.

• **TRADEMARKS.** A trademark is a distinctive word, emblem, symbol, or device, or any combination of

(Continued on next page)

Patents Knowledge Viewed as Useful Tool for R&D Personnel

(Continued from page 17)

these, used to indicate or identify the manufacturer or distributor of a particular product. To be valid it must be used on goods actually sold in commerce or on display associated with the goods or on tags and labels fixed to the goods. Rights in a trademark are acquired only by use and the use must ordinarily continue if the rights so acquired are to be preserved.

The primary function of a trademark is to indicate origin. However, trademarks also serve to guarantee the quality of goods bearing the mark and, through advertising, serve to create and maintain a demand for the product. In the hands of a skillful advertiser a trademark becomes an assurance to the buyer that he is getting what he wants.

A trademark is a valuable piece of property. In many cases a com-

pany's greatest asset may be the trademark identifying its product. Good will built through effective advertising and longstanding use of a trademark would soon be lost through imitation and downright piracy if it were not protected by the courts.

Trademark rights will prevent others from using the same name on the same goods, but do not prevent others from making the same goods without using the trademark. Trademarks which are used in interstate or foreign commerce may be registered in the Patent Office. The Lanham Act of 1946 recodified previous trademark acts and added certain substantive rights.

• **SUPPLEMENTARY NATURE OF PROPRIETARY RIGHTS.** Patents and the other forms of protection for industrial property rights often supplement each other. Thus, a single product, such as a radio, might have novel structural features

which could be protected by one or more patents. It might be sold under a trade name, such as "Saturn," to aid in its identification, and such name, if not previously used on such goods, could be registered as a trademark by the manufacturer. In addition, the advertising copy, instruction manual, or other written material relating to the radio could be copyrighted to prevent any substantial portion thereof from being copied by competitors.

CONCLUSION. *This rather brief summary of the main aspects of patent law is not intended to cover the entire field, but will have served its purpose if it kindles an interest in patents.*

If you have any questions not answered by this article, you are encouraged to send them in to The Judge Advocate General, Department of the Army, Washington 25, D.C., ATTN: Chief, Patents Division.

USASRDL Develops Accurate New Space Tracker

An electro-optical space tracker, termed as "rugged as an artillery piece and accurate as an astronomer's telescope," has been developed by the U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J.

Known as PIM (Precision Instrument Mount), the system has the basic features of phototheodolites, which use a sighting telescope and camera to record the course of objects in space. PIM, however, provides new capabilities in optical and electronic tracking, including television. Automatic, semiautomatic or manual tracking can be accomplished.

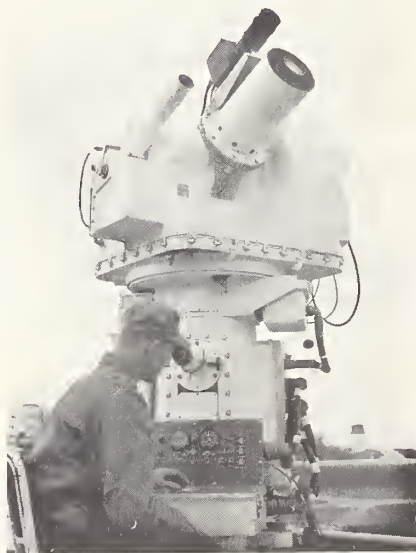
The system records position of objects to the angular accuracy of 180th of a degree and marks the time within 1,000th of a second, even under adverse conditions. It follows missiles and satellites moving several miles a second, manned and drone aircraft, meteorological or special purpose balloons, or any other moving target. Unseen objects are tracked when heat-sensing infrared or radar sensors are used.

For photographing the target itself and recording position and time on the pictures, any standard 35 mm. or 70 mm. still or motion picture camera can be mounted. Angular data in digital form, which is recorded by the system, can be stored on tape or fed directly into a computer for such purposes as analysis of flight paths.

PIM's flexibility has been developed

to the point where the console can be set up remotely and operation controlled by use of closed-circuit television.

Designed to meet the requirements of the U.S. Army Signal Missile and Support Agency at White Sands Missile Range, N. Mex., PIM gives missilemen a new precision tool to help unravel the reason why some shots fail.



This electro-optical system known as "PIM" tracks and records flights of missiles, satellites and space vehicles with phenomenal accuracy.

SCIENTIFIC CALENDAR

Tracking and Command of Aerospace Vehicles, sponsored by the Institute of the Aerospace Sciences, San Francisco, Feb. 19-21.

Importance of Electricity in the Control of Aircraft, sponsored by the Institute of Electrical Engineers-Royal Aeronautical Society, London, England, Feb. 26-28.

Symposium on Current Trends in Nuclear Power, Tucson, Ariz., Feb. 26-Mar. 2.

30th Annual Symposium on Nondestructive Testing of Aircraft & Missile Components, sponsored by SW Research Institute, San Antonio, Tex., Feb. 27-Mar. 1.

Scintillation & Semiconductor Counter Symposium, sponsored by IRE, AIEE, AEC and National Bureau of Standards, Washington, D.C., Mar. 1-3.

Reversible Photochemical Processes, Durham, N.C., March (date undetermined).

Symposium on Equatorial Geophysics, Lima, Peru, March (date undetermined).

Electrical Propulsion Conference, Berkeley, Calif., Mar. 14-16.

Symposium on High-Temperature Solution Chemistry, sponsored by ACS and AFOSR, Washington, D.C., Mar. 20-23.

IRE National Convention, N.Y.C., Mar. 26-29.

Spring Instrument-Automation Conference & Exhibit, sponsored by Instrument Society of America, Dallas, Tex., Mar. 26-29.

Symposium on Solar Sciences, sponsored by the Association for Applied Solar Energy, Phoenix, Ariz., April (date undetermined).

Second Symposium on the Plasma Sheath, sponsored by AFRL, Boston, Apr. 3-5.

Launch Vehicles: Structures & Materials Conference, Phoenix, Ariz., Apr. 3-5.

Symposium on Optical Maser, sponsored by PIB and AFOSR, N.Y.C., April (date undetermined).

13th Annual Advanced Statistical Quality Control Institute, Storrs, Conn., Apr. 8-20.

2nd Symposium on Plasma Sheath—Its Effect Upon Reentry Communication & Detection, sponsored by AFRL, Boston, Apr. 10-12.

2nd International Conference on Stress Analysis, Paris, France, Apr. 10-14.

Institute of Environmental Sciences Annual Technical Meeting & Equipment Exposition, Chicago, Apr. 11-13.

2nd Conference on Kinetics, Equilibria, and Performance of High-Temperature Systems, Los Angeles, Apr. 14-16.

Language School Offers Scientific Russian Courses

Completion of a 10-week pilot course in scientific Russian at the Army Language School, dealing primarily with mathematics, has paved the way for future courses in scientific Russian at the school. Courses will include chemistry, civil and electronic engineering, rocketry, geology and many other scientific fields.

The course, offered at the Presidio of Monterey, Calif., was created to provide students with reading ability and comprehension of Russian technical and scientific journals, texts and scholarly papers with the minimum use of Russian-English dictionaries.

None of the pilot-course students—all of whom were working for their doctoral degrees in mathematics at the near-by Naval Postgraduate School—had had any previous knowledge of the Russian language before enrolling.

School officials said successful results of the program definitely indicate that it is possible to impart to a scientist, who can undertake 300 hours of scientific Russian study, the ability to read Russian technical publications in his field with the aid of a dictionary. And, at the same time,

provide him with the ability to understand and use Russian in its simplest form.

Col James L. Collins, Jr., ALS Commandant, said the pilot program has great potential value. "Scientists working in highly specialized fields are unable to read foreign technical publications because there are so few who understand Russian. Also, at least 50 percent of scientific literature is in languages which more than half the world's scientists cannot read. If our scientists are to keep abreast of developments in other countries, they will have to be able to read this literature," he pointed out.

No new classes have been enrolled since the termination of the pilot course last August. However, instructors and materials presently available at ALS provide the school with the capability of conducting future scientific Russian courses in the fields of chemistry, physics, civil engineering, electronics engineering, electrical engineering, rocketry, aerodynamics, metallurgy, astronomy, meteorology, geology, biology and oceanography, in addition to the one in mathematics.

ARO Veteran Mycologist Retires, Joins NAS

Dr. Lawrence M. Ames, author of a forthcoming "Monograph of the Chaetomiaceae," which is being prepared as the first complete, authoritative work in this field to be published in more than 40 years, has retired from Government career service with the Army Research Office.

Recognized widely as an expert mycologist and for his fungi deterioration research, Dr. Ames has joined the staff of the National Academy of Sciences—National Research Council, Washington, D.C. He will continue his studies of fungi.

Since his transfer, after years of service, from the Fungus Control Laboratory at Fort Belvoir, Va., to the U.S. Army Research Office in August 1958, Dr. Ames has conducted an exhaustive review of all obtainable species of chaetomiaceae. His monograph lists more than 100 species as reported throughout the world.

In discussing the scope of the monograph, Dr. Ames said "it will offer a means of identifying a few 'VIP' fungi of special concern as causative agents in microbiological decomposition of cellulose materials."

Graduated from Michigan State University (then Michigan Agricultural College) with a B.S. degree (1927) and M.S. degree (1929), he was at Harvard University from 1930 to 1932 as an Austin Teaching Fellow. His Ph.D. degree in biology was

awarded by Harvard in 1933.

Dr. Ames' interest in chaetomiaceae began in 1927 while he was studying and teaching part-time under the supervision of Dr. E. A. Bessey, and was broadened by a year of research in the U.S. and Europe under a Secretary of the Army Research and Study Fellowship in 1956.

Dr. Ames voiced a philosophical view of the damage caused by fungi, estimated at billions of dollars annually, by pointing out that much of the loss is offset by the value of the fungi in agriculture, horticulture and forestry in enriching the soil, and in the field of medicine in antibiotics. His monograph, soon to be submitted for publication, points out that the relative ease with which chaetomiaceae can be manipulated in pure culture offers new and scarcely exploited research which could lead to further enrichment of resources.



Dr. Lawrence M. Ames



By Dr. Ralph G. H. Siu
Technical Director, R&E, OQMC

RESISTANCE TO CHANGE. It is quite relaxing at times to participate in one of those pat-yourself-on-the-back sessions, in which a group of scientists nod their heads in solemn agreement as one of their coterie proclaims their acceptance of innovations. Not unlike those stodgy, conservative businessmen—God forbid!

You may be interested in the recollections of some of the most learned scientists over early experiences.

The famous biologist Hans Zinsser commented thusly: "That academics and learned societies—commonly dominated by the older foofoos of any profession—are slow to react to new ideas is in the nature of things. For, as Bason says, *scientia inflat*, and the dignitaries who hold high honors for past accomplishment do not usually like to see the current of progress rush too rapidly out of their reach."

The eminent nineteenth century scientist Huxley wrote in a letter: "For instance, I know that the paper I have just sent in is very original and of some importance, and I am equally sure that if it is referred to my 'particular' friend that it will not be published. He won't be able to say a word against it, but he will pooh-pooh it to a dead certainty. You will ask with wonderment, why? Because for the last 20 years [. . .] has been regarded as the great authority in these matters, and has had no one tread on his heels, until, at last, I think, he has come to look upon the Natural World as his special preserve, and 'no poachers allowed.' So I must manoeuvre a little to get my poor memoir out of his hands."

And finally, the report on his doctorate thesis on thermodynamics by one of the greatest physicists of all times, Max Planck: "I found no interest, let alone approval, even among the very physicists who were closely connected with the topic. Hemholtz probably did not even read my paper at all. Kirchhoff expressly disapproved. . . . I did not succeed in reaching Clausius. He did not answer my letters, and I did not find him at home when I tried to see him in person at Bonn. I carried on a correspondence with Carl Neumann, of Leipzig, but it remained totally fruitless. . . ."

"This experience gave me also an opportunity to learn a new fact—a remarkable one, in my opinion: A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."

ASAP Chairman Changes, R&D Programs Announced

Changes in the Army Scientific Advisory Panel and recommendations for accelerated research and development programs were announced in a recent ASAP Newsletter.

Dr. William Van Royen, Head of the Department of Geography, University of Maryland, was appointed Vice Chairman. He was formerly Vice Chairman of the ASAP Environmental Research Subpanel.

Dr. Roger W. Russell and Ernest J. McCormick were appointed Chairman and Vice Chairman, respectively, of the Human Factors Subpanel.

Brig Gen David C. Lewis is now the Military Consultant for the Chemical, Biological and Radiological Subpanel, as a result of the establishment of the Chemical-Biological Division under the jurisdiction of the Director of Special Weapons, OCRD.

An accelerated R&D program for the employment of satellites as communications relay stations was among the panel recommendations announced in the report.

The Air Mobility Subpanel called for a speedup in the department of V/STOL transport aircraft as well as the continued testing of high altitude surveillance planes.



Dr. William Van Royen

Recommendations by the Chemical, Biological and Radiological Warfare Subpanel included review of the study of disposable paper-based protective clothing priority. The recommendation that intensified effort be directed to energy conversion and storage was also considered.

Other ASAP considerations included environmental research programs for the tropics, improved firepower, human factors coordination, and research and development planning.



Dr. Ernest J. McCormick



Dr. Roger W. Russell

WSMR Fires 1961 Missiles in 1961, Including 15,000th Since 1945

Firing of the 15,000th missile from White Sands Missile Range, N. Mex., was one of the highlights of operations during 1961, the 16th year of activity at the desert installation.

By coincidence, 1,961 "hot" missiles were fired in 1961—Army, 949; Air Force, 863; Navy, 149. A total of 4,816 operations were carried out, including 1,477 range tests and 1,378 checks.

A hot firing is any operation that involves a launch, drop or ejection and use of range instrumentation. Range tests are non-launch operations requiring extensive use of range facilities. Checks call for more limited use of the instrumentation dotting the 4,000-square-mile range.

The above figures indicate the tremendous growth of the missile range since 1945 (only 20 missiles were fired that year). The record for a single year at White Sands is 2,416 established in 1958. The 1960 hot firings total was 2,034.

Missiles most frequently fired at White Sands during 1961 were Honest John, with 114 hot missions; Little John, 75; and Hawk, 57. (See

News magazine, Feb. 1961, page 4, for WSMR "firsts" in missile firings.)

Although these three missiles have long been past the research and development stage, testing at White Sands continues to insure production line quality, improvements and the welfare of the individual systems.

Redstone, the 70-foot giant which served as the vehicle for the space rides of Astronauts Alan Shepard and Virgil Grissom, and which orbited America's first satellite, returned in 1961 to the spotlight at White Sands, where it was originally developed. Four training firings were conducted during the summer and fall by NATO troops from Europe, who in each case handled the weapon under conditions almost identical to those of a tactical situation. A fifth firing was conducted by Redstone troops from Fort Sill, Okla.

Project Banshee at WSMR was designed to study blast behavior at higher altitudes. Giant polyethylene balloons were launched in Hobbs Air Base City, and later Artesia, New Mex., and then detonated over White Sands.

White Sands also played a part in the worldwide Project Mercury man-in-space tracking network and twice recorded progress of space capsules as they orbited the earth.

Even the vital but unheralded Target Missile Project at White Sands marked a milestone during 1961. The 200th target drone of the Firebee series — which underwent ground-launch development in 1959 — was fired at White Sands during the fall.

Fort Huachuca to Entertain Micrometeorological Parley

The U.S. Army Electronic Proving Ground, Fort Huachuca, Ariz., is preparing to entertain 75 scientists at the Fourth Annual Micrometeorological Conference, Mar. 27-29.

Dr. Sverre Pettersen, University of Chicago researcher world renowned in meteorological science, has accepted an invitation to be the guest speaker.

Sixteen Army meteorologists currently engaged in research sponsored by the U.S. Army Electronic Proving Ground, will report on their work. Scientists from other Government agencies will participate as observers.

Army Ordnance Corps Gains by Study of Foreign Weapons Developments

(This article is the first of a series featuring advanced research and new conventional foreign weapons.)

Technological progress and scientific breakthroughs leading to new and successful weapons for U.S. forces may often be a direct result of the adaptation or influence of new weapon concepts and developments in foreign countries.

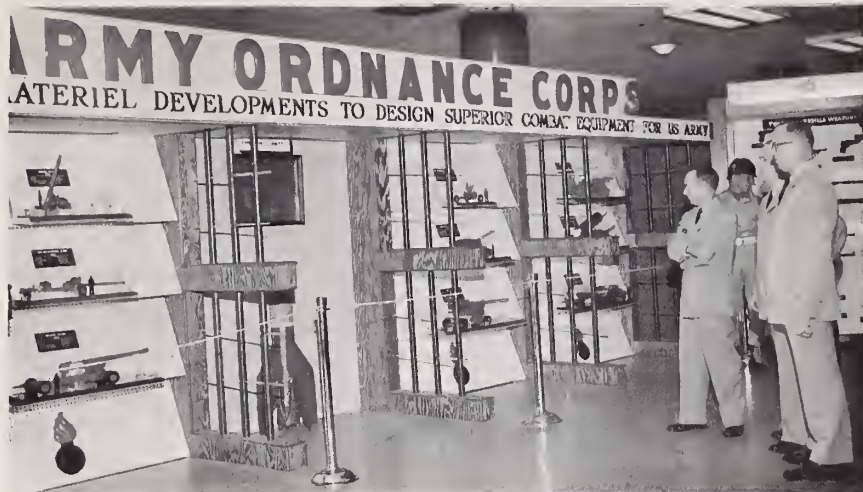
An estimated 11,000 persons recently viewed an exhibit of foreign weapons and equipment displayed by the Army Ordnance Corps in the Pentagon, Washington, D.C.

Featuring the exploitation of foreign materiel by the U.S. Army Ordnance Corps, the display consisted of actual items of ordnance equipment, scale models, photographs, and a continuous-run slide and sound projection system which outlined Ordnance Corps' testing of foreign materiel.

The display presented the various steps taken by Ordnance to utilize this valuable adjunct to our own research and development programs. Included were such items of guerilla warfare as pistols, rifles, grenades, and small arms from France, Italy, Czechoslovakia, Russia, West Germany, and from such diverse sources as the rebel elements of Laos and the Mau Maus of Kenya.

A continuing project of the Army's Ordnance Corps, this utilization and adaptation of foreign materiel has often been instrumental in cutting down the lead time involved in the production of new or improved weapons, as well as effecting other substantial savings in production costs.

A few representative examples of exploitation of this nature which have "paid off" to date are development of our M60 machinegun, the hydraulic



Ordnance Corps displays foreign weapons, equipment in Washington, D.C.

retraction system of the U.S. 175 mm. gun, and a new type of mortar projectile.

The M60 Machinegun. This machinegun (see January issue, page 12) has a feed system incorporated in its design which closely parallels the system utilized by the German machinegun MG-42; its operating system is based on a detailed study of the German paratroop rifle FG-42 of World War II.

Hydraulic Retraction System of the 175 mm. Gun. The use of a hydraulic retraction system for the 175 mm. gun tube, in addition to a recoil system for the top carriage, was patterned after the recoil system of the 175 mm. gun used by the German Wehrmacht in World War II.

Mortar Projectile. A new cast-iron mortar projectile, first used extensively by troops of the U.S.S.R., Communist China, and North Korea, is

currently in production for our own combat forces.

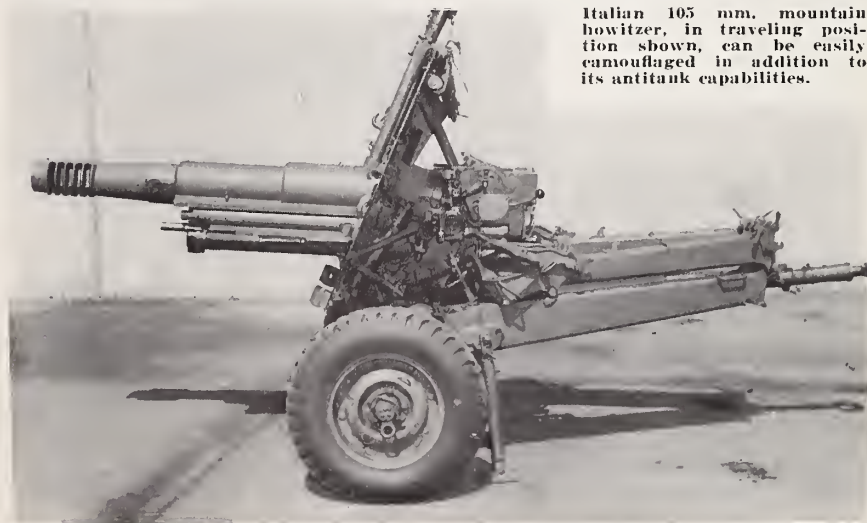
Italian 105 mm. Mountain Howitzer. Although most of the U.S. R&D effort has been directed toward the missile and space field since World War II, several Free World countries have placed appreciable emphasis on development of new conventional artillery weapons.

One of these is the Italian 105 mm. mountain howitzer M1956. This weapon has attracted much international interest. It was designed as a light artillery piece for employment in mountainous terrain; it is, however, readily adaptable to jungle warfare and airborne missions. It fires standard U.S. 105 mm. howitzer M2A1 ammunition, less the Zone 7 propellant increment.

Weighing only 2,750 pounds, the M1956 can be towed by a ¼-ton vehicle. (Continued on next page)



Typical foreign guerilla weapons displayed at recent Ordnance exhibit.



Italian 105 mm. mountain howitzer, in traveling position shown, can be easily camouflaged in addition to its antitank capabilities.

Polar Expert Suggests Closer Scientific Ties Needed With Australia, New Zealand, India After Tour

Closer national scientific ties with Australia, New Zealand and India appear highly desirable in the interest of mutual advantage, Dr. Paul A. Siple, U.S. Army Research Office Scientific Adviser, reported following a 4-month tour of those countries.

Dr. Siple formed his opinions regarding possibilities of improved scientific cooperation during a goodwill tour made under the joint auspices of the U.S. State Department and the Office of the Chief of Research and Development, Department of the Army. OCRD has a policy of broadening the R&D base wherever possible among Free World nations.

Selected by the State Department "to help present the image of American specialists" under its worldwide cultural affairs program, Dr. Siple delivered more than 60 lectures (32 formal public presentations), took part in six scientific seminars, and made TV and radio appearances.

In addition, he participated in some 300 individual technical discussions with key scientists and professional leaders of the countries visited, attended numerous group scientific sessions, and provided impromptu advice on areas of specialties. His activities included 26 press interviews, 50 "significant contacts" with research and educational institutions, and attendance at numerous U.S. Information Service, Embassy or special social events (12 as a guest of honor).

Working out of United States Em-

bassies in each of the countries visited, and in cooperation with Cultural Affairs Officers, Dr. Siple followed itineraries arranged by Government and scientific agencies. For example, in Australia he met with leaders in Sydney, Melbourne, Canberra, Armidale and Brisbane.

The Australian Government CSIRO (Commonwealth Scientific and Industrial Research Organization) is making an all-out effort to gain prestige in world science, Dr. Siple reported. Laboratories are ultramodern, well-equipped, well-staffed, continuously expanding and increasing in number. In Dr. Siple's opinion, pioneering work of a high order of basic research is being done in geophysical fields.

In New Zealand, likewise, "good quality work" was reported in universities and research establishments. One of the current problems is that more attractive offers are luring top quality scientists to Australia and other countries, since the country is handicapped in industrialization.

In India and Ceylon, one of the high points of Dr. Siple's visit was participation in the Ceylonese Science Congress, sponsored by the Ceylon Association for Advancement of Science. Papers were organized into six sections: Medical and Veterinary Sciences, Agriculture and Forestry, Natural Sciences, Physical Sciences and Social Sciences.

The limited nationally sponsored research in India is of a high order in the struggle of the new democracy to progress as an independent nation, Dr. Siple said. He was impressed by strides in medical, textile, physical and meteorological institutions he visited in regions around Bombay, New Delhi and Calcutta.

Enroute to Australia, he stopped in Hawaii to attend the Tenth Pacific

Science Congress, a 2-week session in Honolulu sponsored by the National Academy of Sciences in Washington, D.C., the Bernice Bishop Museum, University of Hawaii and the Pacific Science Association. Nearly 600 of the 1400 participants represented U.S. scientific groups, including all the Armed Forces and the Department of Defense.

During an 11-day stopover in the Antarctic, Dr. Siple inspected operations and facilities, noting changes since his last visit there in 1957 in connection with the U.S. Army's International Geophysical Year participation. He gave a solicited report to the Commander of the U.S. Naval Support Force and officials of the National Science Foundation concerning South Pole Station drift control measures, an improved water supply system, an addition to the science building and various corrective actions to surmount problems.

New Film Depicts Operations At White Sands Missile Range

"Proving Army Missiles at White Sands" is the title of a new film ready for release to the public.

Produced by the Pictorial Division of the Army Signal Missile Support Agency at White Sands, N. Mex., the film explains the nature, scope and purpose of the Ordnance Mission operations. The 20-minute film is 16 mm. in color with sound, and is intended for showing to visiting VIPs, schools and civic groups.

Covered in the film are static testing, flight simulation, stress testing of metal specimens in the OM calibration laboratory, environmental testing, exposure of missile components to gamma radiation and missile warhead detonation tests. Wyndel E. Haynes of SMSA wrote the script.

Persons interested in borrowing WSMR films should write the Commanding General, White Sands Missile Range, N. Mex., Attn: Information Officer.

Army Ordnance Studies Foreign Weapons Developments

(Continued from page 21)

hicle such as the U.S. Army jeep. It can be quickly disassembled into 12 loads, for airdrop or for transportation by mules. It can, also, be airdropped in fully assembled form.

One of the novel features of this weapon is its flexible carriage, which greatly simplifies problems of fire and movement in difficult terrain. The suspension system allows the trunnion axis to be adjusted to a height of either 25 or 40 inches.

When in the low position, the weap-

on can be easily camouflaged—a distinct advantage to its already existing antitank capabilities. The position of the wheels may also be adjusted to track widths of either 45 or 52 inches. The 3-piece box-section trails are hinged at two points, fold up or down, and can be shortened at will by removing intermediate trail sections.

The new howitzer has successfully passed tests by the United Kingdom, Australia, West Germany, and the United States. Great Britain has purchased a quantity of these weapons.

Army Lets \$4,463,694 Contract For M116 Amphibious Carrier

Production of the M116 Amphibious Cargo Carrier and related items is called for in a \$4,463,694 Army contract awarded to the Blaw Knox Co., Construction Equipment Division, Matton, Ill.

A lightweight, low-silhouette vehicle, using an all-welded aluminum hull, the M116 is designed to transport cargo and/or personnel. Combat loaded weight is about 10,000 pounds with 1½ tons of cargo, and maximum speed is about 40 m.p.h. on land and 4 m.p.h. in water.

The vehicle accommodates 12 men, including the driver, when used as a personnel carrier. It is capable of operation with a full load over unimproved roads and trails, hilly country, and inland waterways, under all seasonal conditions in arctic, temperate and tropical zones.

The contract will be administered by the Chicago Ordnance District.

ASPR XV Provisions Explained for Benefit of Contractors

Utilization of the provisions of Section XV of the Armed Services Procurement Regulation—as a means to establishing by advance agreement the definite extent of reimbursement to contractors for their independent R&D program costs—was discussed in the January issue, page 8.

That article reviewed the chronological highlights of long-pursued efforts to bring about a workable system that would protect Government interests and be fair to contractors for independent R&D program costs actually incurred. The result was paragraphs 15-205.35 and 15-107 of ASPR, prescribing principles and procedures to be followed in negotiating advance agreements on those costs.

Provisions of Section XV became effective July 1, 1960. They established uniform negotiation procedures for the Departments of the Army, Navy and the Air Force in determining the reasonableness of contractors' independent R&D costs.

Department of Defense Instruction No. 4105.52, dated June 28, 1960, covers responsibilities governing uniform negotiation procedures. Among primary factors is "reasonableness of expenditures" for independent R&D costs of contractors after proper segregation is established and the quality of work proposed is evaluated.

Harold F. Weller, Special Assistant to the Deputy and Scientific Director, U.S. Army Research Office, recently has been visiting a number of Army R&D installations to present briefings on Section XV.

Assigned primary responsibility for review and evaluation of contractor research proposals submitted to the U.S. Army Research Office, Mr. Weller is an alternate member of the Armed Services Research Specialists Committee. This committee was established by DOD Instruction No. 4105.52.

Committee Chairman is Willis Foster, Deputy Director, Office of Science, Office of the Director of Defense, Research and Engineering. The other members are: Dr. F. Joachim Weyl, Deputy Chief and Chief Scientist, Office of Naval Research; James V. Burke, Deputy Director, Advanced Developments, Deputy Chief of Staff (R&E), Air Force; Dr. Richard A. Weiss, Deputy and Scientific Director of Army Research, Office of the Chief of Research and Development.

Under the established ASPR Section XV procedure, contractors doing business with more than one of the Armed Forces, and seeking advance agreements with the Government, will submit copies of a brochure describ-



R&D DIGNITARIES TOUR WRAIR. Assistant Secretary of the Army (R&D) Dr. Finn J. Larsen headed a group of Army R&D leaders on his first official tour of Walter Reed Army Institute of Research, Washington, D.C., Jan. 19. Shown (l to r) are Maj Gen Clinton S. Lyter, CG, Walter Reed Army Medical Center; Brig Gen James H. Forsee, Medical R&D Chief; Maj Gen Dwight E. Beach, Deputy Chief, Army R&D; Col Conn L. Milburn, Jr., WRAIR Director and Commandant; Lt Gen Leonard D. Heaton, Army Surgeon General; Dr. Larsen; Maj Gen Floyd L. Wergeland, CG, Walter Reed General Hospital.

ing each R&D project. Included is an indication of the amount of money budgeted for each project.

When requested, the Armed Services Research Specialists Committee reviews the brochure. It then recommends to the sponsoring department the extent to which it is reasonable to support such programs. Where appropriate in its review, the ASRSC uses services of other research specialists such as, for example, in respect to the Army, scientists in the Technical Services and the U.S. Army Research Offices in Washington, D.C. and Durham, N.C.

In cases where the contractor is doing business with only one of the Armed Forces, negotiation and review of the program, if required, might be done within the agency concerned—without referring the proposal to the ASRSC for evaluation. R&D Directive No. 70-13, dated Apr. 20, 1961, was issued to cover such cases.

The Armed Services Research Specialists Committee makes recommendations concerning the scientific quality of the contractor's program. This information, combined with financial data available to the negotiators, is used to negotiate the level of support that the Government will accord the contractor's independent R&D program. The advance agree-

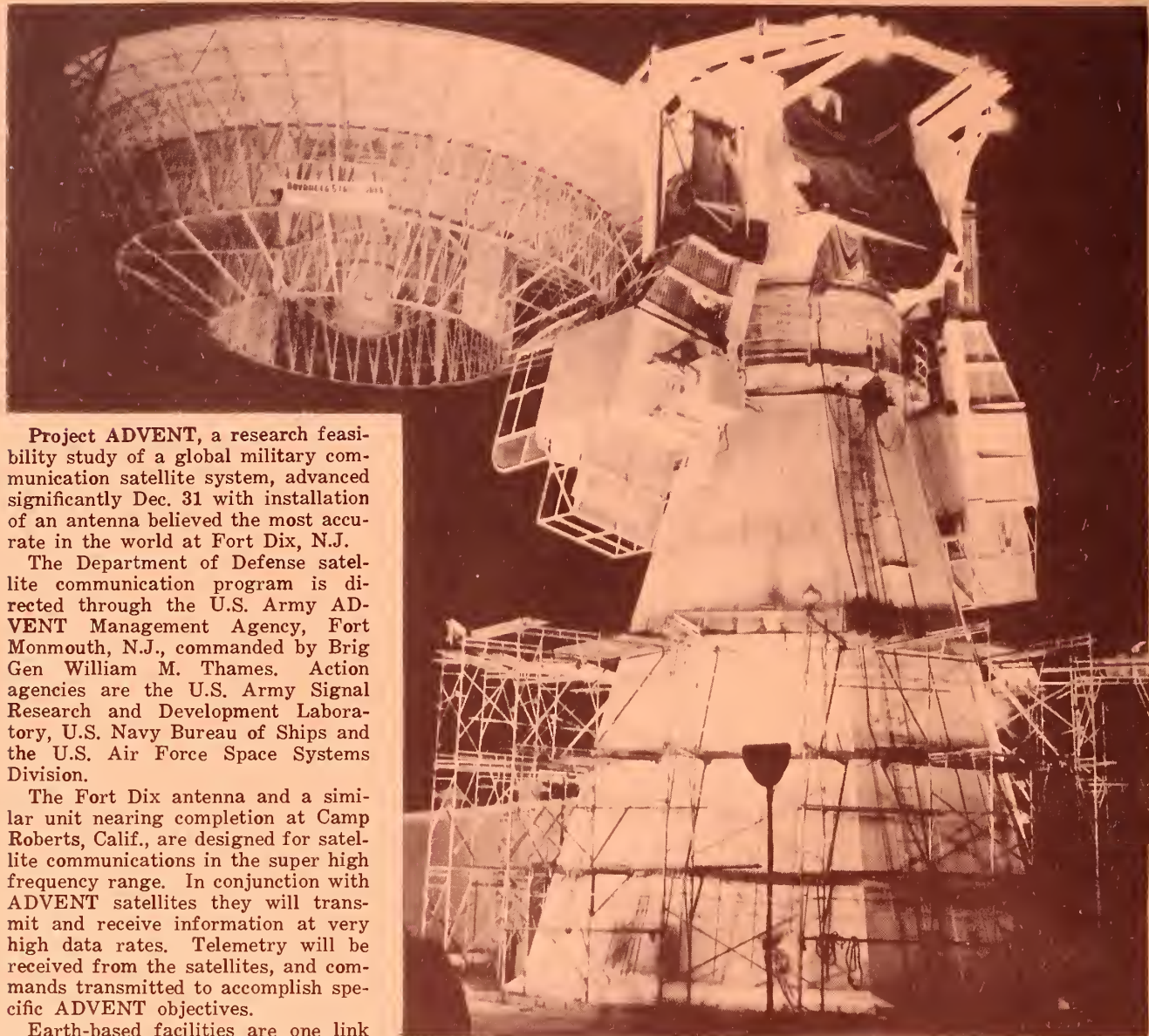
ment is applied to all negotiated procurement where the contractor's actual costs or estimated costs are a major factor in the negotiation of price.

The agreement also is used in determination and/or negotiation of overhead costs for cost-type contracts. The primary purpose of the advance understanding is the determination of reasonableness concerning independent R&D effort of high scientific quality.

Preliminary to negotiation of an advance understanding, the contractor is required to submit financial data relating to past expenditures for independent R&D for a period of three to four years. Additional information is obtained on sales and production volume, historical and estimated, including a statement as to the proportion of Government business performed by the contractor.

Data concerning the accounting treatment of independent R&D costs also are obtained from the contractor and often are reviewed with the cognizant Government audit agency. Immediately prior to the negotiation meeting, current financial data are obtained to compare actual expenditures during the period with planned expenditures as set forth in the contractor's technical program.

Project ADVENT Advances With Installation of Antenna Stations



Project ADVENT, a research feasibility study of a global military communication satellite system, advanced significantly Dec. 31 with installation of an antenna believed the most accurate in the world at Fort Dix, N.J.

The Department of Defense satellite communication program is directed through the U.S. Army ADVENT Management Agency, Fort Monmouth, N.J., commanded by Brig Gen William M. Thames. Action agencies are the U.S. Army Signal Research and Development Laboratory, U.S. Navy Bureau of Ships and the U.S. Air Force Space Systems Division.

The Fort Dix antenna and a similar unit nearing completion at Camp Roberts, Calif., are designed for satellite communications in the super high frequency range. In conjunction with ADVENT satellites they will transmit and receive information at very high data rates. Telemetry will be received from the satellites, and commands transmitted to accomplish specific ADVENT objectives.

Earth-based facilities are one link in the ADVENT program to develop, launch and test active-repeater microwave communications payloads in the 22,300-mile-high synchronous orbit. Satellites orbiting at that height will travel at the same speed as the earth's rotation, appearing to hover in space.

Stability of the antenna mount is the important consideration, General Thames said, because the aim of the ADVENT antenna must be accurate to within 0.024 degrees. An antenna aiming error of one degree would miss a synchronous orbit satellite by 385 miles.

Accordingly, construction of the antenna tower was planned for stability to insure pinpoint accuracy. An 84-foot hole was dug 30 feet deep and packed with layers of special con-

Nine-ton "dish" antenna being lifted onto 3-story tower by 200-foot crane.

crete—10,108,800 pounds of it—as the base for the 65-foot tower. The tower consists of 190 tons of 1-inch-thick steel plate welded together with three tons of rods.

The rotation-elevation pedestal mount upon which the 60-foot parabolic antenna dish rests contains gears which give it the precision of a 120,000-pound-watch. Despite its weight, the antenna reflector can make a revolution every 60 seconds.

Feasibility operations at the Fort Dix ground station will be directed from the U.S. Army ADVENT Management Agency at Fort Monmouth. General Thames did not give an exact

date for tests to begin but said that initial experiments in 1962 will be made with an active communication satellite in a 6,000-mile-high orbit, with a period of about six hours.

Installation of the Camp Roberts ADVENT antenna was about complete as this publication went to press late in January. Like the Fort Dix antenna, it is being erected by the Sylvania Electric Products, subsidiary of General Telephone and Electronics.

The ultimate objective of Project ADVENT, it was stated, is to prove feasibility of using a satellite system for virtually instantaneous global communications through space to meet modern military requirements.